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Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
N. C. Hudson, assistant editor

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Prosthetic dentistry

A retaining device for partial dentures

Martin Handlers, Nathaniel H. Lenchner and Bernard Weissman. *J.Pros.Den.* 7:483-488 July 1957

A new method for retaining partial dentures overcomes most of the disadvantages of previous methods of retention. The device utilized is a metal cylinder containing a coil spring and a notched cylindrical bar (Fig. 1). There is an opening in one end of the cylinder through which a portion of the bar protrudes under the action of the spring. This action is limited by an adjustable lock screw which is set perpendicular to the bar and is received in the notch. All parts are easily accessible and replaceable as a unit or in parts. The device is constructed of materials which are compatible with the oral fluids.

The attachment is either processed into the acrylic resin portion or soldered to the metal framework of the partial denture. It is set in such a position that the tip of the bar protrudes and fits into a receptacle previously prepared in the cast abutment (Fig. 2, 3). In the placement of the coil spring attachment for connection to the appliance, it is positioned so that the bar tip remains in place passively once the denture is seated. The function of the lock screw is to limit the protrusion of the bar. The retainer requires an occlusal rest placed in the opposite proximo-occlusal position from the attachment. It is received in a rest seat which has been prepared previously in the cast abutment (Fig. 4). The rest seat is prepared at right angles to the long

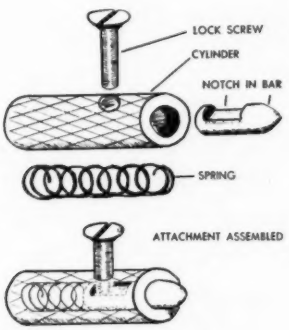

Figure 1 The spring retentive device

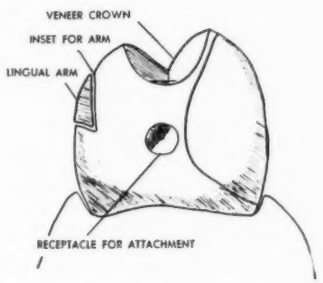

Figure 2 A veneer crown designed for use of the retentive device

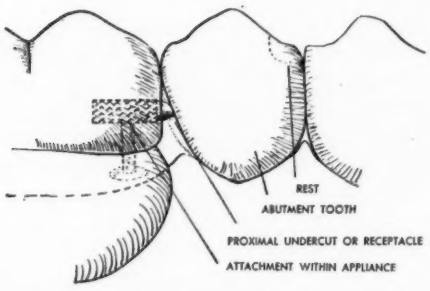

Figure 3 Diagram of the device in place in the appliance and its relation to the abutment

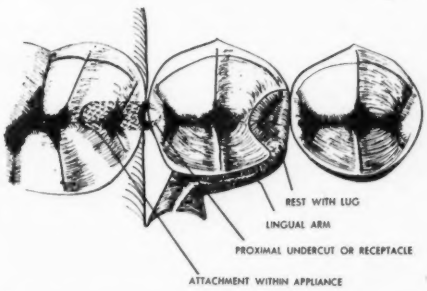

Figure 4 Diagram of the device in the denture base in relation to the lingual arm and occlusal rest

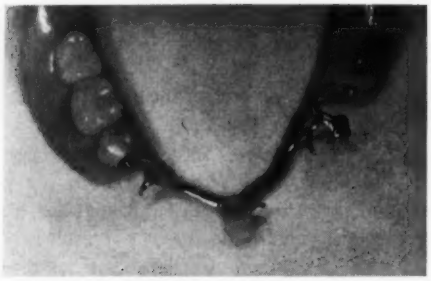

Figure 5 A denture with the device in place

Figure 6 The denture in position. Note absence of buccal clasp arm

axis of the tooth and should be as deep as practicable. The main functions of the rest are to transmit occlusal stresses along the long axis of the tooth and maintain the denture in its predetermined position, thereby preventing undue tissue displacement by the appliance, which would result in rapid tissue changes. Lateral stresses are opposed by the occlusal rest, a rigid lingual arm and the coil spring attachment. Together these components encompass more than 180 degrees of the tooth circumference. The lingual arm can be positioned in a previously prepared inset built into a cast crown.

When the device is used with natural abutments, a rest seat is prepared at right angles to the long axis of the tooth in the proximo-occlusal position opposite to the position of the coil spring attachment (Fig. 3, 4). The attachment engages the natural proximal undercut and is placed so that, once seated, the bar tip remains in place passively, and no pressure is exerted on the abutment tooth. The lingual arm is connected to the occlusal rest and the framework. The principles of opposing forces are satisfied as with cast abutments.

The new retaining device has the following advantages:

1. It maintains its relation to the abutment during function.
2. Esthetics are superior, as no part of the device extends on the labial or buccal surfaces of the abutment teeth.
3. Adjustments are rarely, if ever, necessary.
4. Repair is easily effected because all parts are readily removable and replaceable. Laboratory procedures are rarely involved.
5. The reduction of the contact area reduces the susceptibility to caries.
6. The use of prepared abutments and castings is optional.
7. No extensive or new clinical procedures are involved.

The device may have universal application. The results will be evaluated after the device has been in service for a greater period of time.

301 East Twenty-third Street, Brooklyn 26, N.Y.

A preliminary report on resilient denture plastics

G. A. Lammie and R. Storer. *J.Pros.Den.* 8:411-424 May 1958

Case histories of 130 patients fitted with complete dentures incorporating soft resins have been kept in the department of dental prosthetics of the University of Liverpool for the past four years. These patients are being recalled every six months for examination of the denture base and the oral condition. Most of the patients gave histories of inability to wear complete lower dentures on account of pain. Of 109 patients with such histories, 91 have reported continued absence of symptoms or greatly improved comfort when a denture with a soft base has been substituted for one made entirely of a hard acrylic resin.

The mere replacement of a hard base with a soft base is not always sufficient. Attention must be paid to correct denture extension and to the development of a balanced centric occlusion. Recall studies have revealed the absence of ulcer-

ation under soft lining where this had been evident previously. Severe resorption of the ridge allows for a considerable bulk of hard acrylic resin in the appliance, which gives it adequate strength. If lack of ridge resorption prevents the use of a sufficiently thick layer of acrylic resin, the denture may fracture; six have, and repair is difficult if not impossible.

Two materials were used to fabricate soft denture flanges extending into bilateral undercuts in seven patients. An increase in retention was noted, but difficulty was experienced in inserting the denture when the undercut regions to be engaged were gross. Five dentures with soft material inlays over hard median raphes were constructed; results were encouraging, if not spectacular.

Materials in the following classes were used: (1) natural rubber, (2) polyvinyl chloride, (3) polyvinyl acetate, (4) methyl methacrylate copolymer and (5) silicone products.

Natural rubber has a high water absorption and becomes foul and ill-fitting after use.

Fifty-one lower dentures were lined with Provinyl-p.Ultra, a polyvinyl chloride developed by Jarby of Copenhagen. Clinically, the bond strength seemed superior to that of the other materials used, and resiliency has been maintained in some instances for 18 months. In other instances, there has been hardening, cracking, and breakdown of the bond with the acrylic base material. Vernosoft, an American product, has been tried in three dentures. At the time of last recall, eight months after insertion, the resiliency was being maintained. The great disadvantages of polyvinyl chloride result from its high and critical gelling temperature. On the other hand, its dimensional stability in processing, its low water absorption and good bonding potential suggest it might be the best material.

Polyvinyl acetate, unfortunately, has a high water sorption which contraindicates its use in the mouth.

Plastupalal, a German methyl methacrylate copolymer, lacks bonding strength with acrylic resin, and has a low resistance to abrasion.

Although the low water sorption of the silicone rubbers would seem to commend their use in the mouth, their high processing temperatures and high linear contractions so far have mitigated against their use.

One proprietary product, D. P. Veldent, has been used with some success. Its high bond strength to acrylic resin makes it useful in dentures where unsupported resilient flanges engage bilateral undercuts. There is some loss of material from the surface in use, and the material tends to swell. Flexibase recently became available and has been used in dentures for ten patients. Early inspection seems encouraging.

Desirable properties in a soft denture resin include ease of processing, dimensional stability during processing, low water sorption, high bond strength to acrylic resin, high abrasion resistance and maintenance of resiliency.

Were a suitable resilient denture base material available, it would be used extensively. The combined use of soft and hard plastics may give superior results in the following circumstances: (1) in the complete lower denture where the patient has pronounced senile atrophy; (2) in developing maximal retention where the residual ridges are undercut bilaterally; (3) in mouths where a hard median palatal raphe is associated with a poor retention potentiality, and (4) in obturators for acquired and congenital clefts of the palate.

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Porcelain fused to gold

Frank D. Dunworth. *J.Pros.Den.* 8:635-639
July 1958

Ceramic porcelains fused to gold castings are especially indicated for: (1) anterior jacket crowns where the occlusion, or posterior support, is such that regular full porcelain jacket crowns are contraindicated; (2) all posterior jacket crowns; (3) all abutments for fixed partial dentures where complete coverage is indicated; (4) pontics for fixed partial dentures; (5) full coverage abutment crowns to carry the occlusal rests and clasps of removable partial dentures; (6) full coverage abutment crowns housing female precision attachments for removable partial dentures; (7) specially designed and constructed facings for particular problems, and (8) splinting teeth for multiple abutments or periodontal therapy.

Although the manufacturers supply formulas for matching New Hue shades, the author has found these to be unsatisfactory, and has made up a shade guide which, with the judicious use of 1,600° F. stains and overglaze, meets his requirements reasonably well.

The four instances of fracture experienced have been caused by failure to remove sufficient tooth structure from the lingual surfaces of the upper anterior teeth. The chemical bonding of the porcelain to gold appears to be excellent. Precision attachments can be soldered to the gold alloy onto which the porcelain is baked. Not once has an attachment moved or warped during soldering or in the subsequent baking of the porcelain to the metal structure.

In the design of fixed partial dentures where porcelain is to be fused to gold, rigidity in the casting should be emphasized.

135 Macquarie Street, Sydney, Australia

A reconsideration of occlusion in full dentures

Niels Brill and G. A. Lammie. *Odont.Tskr.* 66:175-182 April 1958 [in English]

A hypothesis is presented that is founded on clinical observations and on some established physiological principles. The validity of the hypothesis in its details remains to be proved by scientific investigation.

A common method used to record centric relation is the Gothic arch tracing. Posselt (1952) has shown that in natural human dentitions, centric occlusion coincided with centric relation in only 10 per cent of the persons investigated, whereas in about 90 per cent, centric occlusion was about 1 mm. in front of centric relation.

When the teeth erupt and come into occlusion, a specific innervation pattern of closing is developed. When a person loses his teeth, he is not able to perform exactly the pre-existing movements, partly because the function of the periodontal proprioceptors is lost. This does not mean, however, that the innervation pattern is lost; on the contrary, it will remain dormant in the patient and the possibility of its reactivation has been shown by Bloch (1917). The other nervous structures and pathways, which formerly took part in organizing the movement patterns, are not destroyed when the teeth are extracted. The innervation patterns are preserved in these other nervous structures and pathways. When dentures are inserted, the exteroceptors of pressure and touch of the oral cavity and especially of the denture foundations will take over the function formerly performed by the periodontal proprioceptors. These exteroceptors are coupled with the dormant innervation pattern, which in this way is called back to life.

If occlusal patterns are established in a patient with complete dentures, based exclusively on a recording of the mandible in a retruded position, a wrong procedure is being used in most instances. If the dentist records the retruded position and does not make corrections for individual variations, he is preparing the ground for a conflict between the new, artificial occlusal pattern and the dormant, learned innervation pattern.

Some people readily adapt to complete dentures for which a Gothic arch tracing or a similar procedure has been used, and without occlusal adjustments being made. Presumably, these people are those who formerly had a centric occlusion coinciding with the centric relation, or those, especially young people, who may easily acquire a new movement pattern. But harm is being done those other patients in whom the conflict is not readily settled. Such patients often show signs of inflammatory reactions in the denture foundations or signs of functional disturbances in other structures belonging to the masticatory mechanism. Such damaging effects can be reduced by adjusting the occlusal pattern in such a way that harmony is established between this pattern and the innervation pattern.

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Orthodontics

An improved chrome facebow with cervical anchorage

A. D. Mollin. *Orthodontic Record* 1:3-11 April 1958

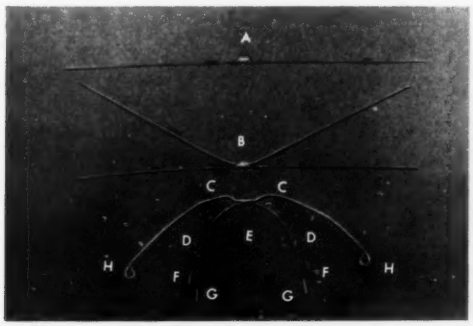
An improved chrome face-bow is described, which is easy to construct since it requires only one soldered connection. The technic of construction is as follows:

1. An 0.060-inch diameter tube is soldered to the middle of a 7-inch length of .041 wire (Fig. 1, A). If Oppenheim elastics are indicated, a 9-inch length of .041 wire is used, for making the necessary loops to hold the elastics.

positions (Fig. 1, E and 2). About three quarters of an inch mesial to the position of the buccal tube, a loop is bent on the inner bow about a half inch high and three quarters of an inch long (Fig. 1, F), so that the distal part of the loop touches the mesial surface of the buccal tube on the molar band. The wire of the inner bow is cut distal to the loop about the length of the buccal tube into which it is to be inserted (Fig. 1, G).

The distal part of the loop acts as a stop when the inner bow is inserted in the buccal tubes. By elongation or contraction of this loop, the anteroposterior length of the inner bow may be increased or decreased. Since the stop is not soldered or heated, the inner bow maintains its resiliency, shape and inherent springlike qualities.

The inner bow is completed by contouring so that it does not impinge on any part of the teeth, soft tissues or fixed appliances when inserted in the patient's mouth. Elastic traction is applied. The ends of the outer bow are bent over themselves in the shape of a quarter inch hook and



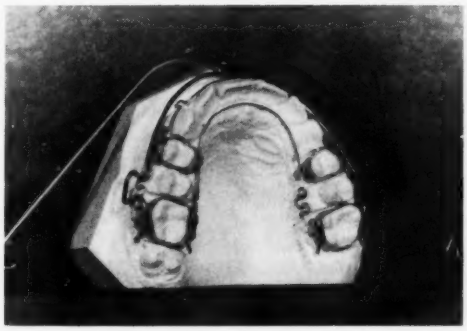


Figure 1 (Left) Technic of construction of face-bow
Figure 2 (Right) Appliance for Class II, Division 1 malocclusion of permanent dentition

2. An 8-inch length of .059 wire is inserted into the tube, centered, and both sides of the wire bent up at about a 45 degree angle (Fig. 1, B).

3. The .059 wire outer bow is bent back about a half inch from the tube to clear the lips when the face-bow is inserted in the mouth (Fig. 1, C).

4. If Oppenheim elastics are indicated, a complete loop distal to the cuspid region is bent on both sides of the inner bow (Fig. 1, D).

5. The inner bow is contoured to the shape of the patient's dental arch on a model which has two molar bands with buccal tubes in their proper

angulated laterally. The ends of the elastic bands are inserted in these hooks. The angulation of the ends of the outer bow prevents the metal ends of the elastic neckband from becoming disengaged during sleeping movements.

The completed face-bow is inserted in the patient's mouth and tested. The inner bow should slide freely into the buccal tubes and should not touch any tooth, soft tissue or fixed appliance. The outer bow is adapted to the contours of the face by inserting the metal hooks of the cervical neckband into the formed hooks of the outer bow,

and then by shaping the outer bow with a three beak clasp plier until this frame rests about a half inch away from the face when elastic traction is applied. The cervical elastic neckband is adjusted until about 12 ounces of pressure are registered. The patient is instructed to wear the face-bow for a minimum of 14 hours a day.

Four case reports are presented in which this face-bow was used successfully to correct Class II, Division 1 malocclusion (in three patients) and Class II, Division 2 malocclusion (in one patient).

Claimed advantages of this face-bow over the standard type in general use are as follows: (1) greater adjustability of the inner bow; (2) quicker and easier construction, fitting and adaptation, and (3) better control of the temper and resiliency of the wire. The improved chrome face-bow is rigid, resistant to deformation during use, and seldom is broken.

260 Middleneck Road, Great Neck, N.Y.

The treatment of chronic nasal obstruction by subluxation of the vomero-maxillary articulation

C. J. Griffin. *Austral. D.J.* 3:107-117
April 1958

On May 8, 1913, George Brown read before the Dental Society of the State of New York a paper entitled "The Pathologic and Therapeutic Possibilities of Upper Maxillary Contraction and Expansion." He said in part: "After approximately 15 years' continuous experience in widening dental arches by rapid expansion for the purpose of enlarging the nares through separation of the median palatine suture, or, as I have previously called it, 'readjustment of the maxillary bones,' with almost invariably satisfactory results in giving at least a measure of intra-nasal relief, it is with surprise that I note a more or less marked tendency among orthodontists to question the practicability of this simple process; the more so because the idea is not new."

Objections to Brown's treatment were raised, it being asserted that he did not pay sufficient attention to the occlusion, that his roentgenograms did not illustrate convincingly the opening of the intermaxillary suture, and that if he did succeed in opening the suture, the increase in internasal width could not be maintained. Twenty-five years later, in a textbook, Brown reiterated his claims, and asserted that he had procured impressive clinical results, especially among growing children.

Brown had discarded the slow method of intermaxillary separation, and utilized surgery. Prior to operation he inserted a maxillary expansion splint. At operation, he pried apart the maxillae by inserting a fine chisel into the labial aspect of the intermaxillary suture. Brown's clinical findings were supported by the anatomical findings of Harris Peyton Mosher, who had detected a link between the dentition and deflection of the vomer.

The patient usually has a history of chronic nasal obstruction and allied conditions, such as hypersecretion, hay fever, bronchial asthma and migraine. The patient usually is slender, with a narrow face and narrow nose, a hollow or flat chest, and prominent clavicles. The alae nasi and the anterior nares usually are asymmetrical. The most consistent diagnostic sign is hypertrophy of the inferior conchae and their contact with the septum.

The method of treatment utilized by the author is as follows: Orthodontic bands are fitted to the maxillary first bicuspids and first molars. An impression is taken with the bands in place. The bands are then removed and placed in their appropriate positions in the impression. A model is cast. One thickness of ordinary prosthetic wax is adapted to the lingual convexities of the maxillary teeth of each side from the second molar to the cuspid. These wax strips are then cast in coin silver and soldered to the orthodontic bands. A modified jack screw is then fitted across the palate in the region of the first bicuspid and soldered to the metal bars. The device is cemented into position. The nut on the jack screw is turned morning and night until the patient experiences pressure but not pain.

As pressure is applied, the suture opens from behind forwards. At the beginning of the second week the central incisors will be noted moving apart. The degree of anterior opening proceeds quickly and is probably at its greatest by the end of the third week. The anterior opening should never exceed 2 to 3 mm. The expanding

device is then removed and an acrylic plate designed to maintain the degree of lateral movement of the maxillae is inserted; this should be done as soon as possible, since in a matter of hours appreciable reversal occurs. The plate should be worn for at least six weeks. When the plate is removed the teeth return to their occlusal relations in a week or two. The permanent increase in lateral width of the maxilla probably never exceeds 1.5 mm.

Seven case reports illustrate the success attained with this therapy, the purpose of which is to induce changes in the nasal fossae so that the nares and the masticatory apparatus can perform their respective functions better. The ultimate result of the therapy is to relieve intranasal tension and in certain instances to abort allergic reactions.

This form of therapy should be attempted only when roentgenographic or visual examination reveals a congenital dislocation of the vomeromaxillary articulation. The success of the therapy probably depends on a moderate increase in lateral width of the nares and changes occurring at the vomeromaxillary articulation; the latter changes in turn are dependent on the lateral growth of the vomerine wings on the side of the deflection.

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Arch length deficiency in mixed dentition

Herbert R. Foster and Wendell L. Wylie.
Am.J.Orthodont. 44:464-476 June 1958

Of all kinds of malocclusions, arch length deficiency is the one most frequently encountered. Even casual inspection suggests that size of the teeth has something to do with it. The report by Nance (1947) of a long-term study of the dimensions of the lower dental arch had a profound influence in orthodontics. Nance demonstrated that deficiencies of arch length could be overcome temporarily through orthodontic treatment, but that all too often alterations of tooth position in the postretention period brought about a return to arch dimensions equal to or less than those present in the original conditions.

About ten years ago the authors began a ten year serial study of 34 children. In each instance, complete intraoral films, cephalometric films, and plaster models were obtained. When these records were complete, the mandibular deciduous cuspids were removed in several of the children. This was done because there was crowding in the mandibular anterior segments (23 patients) and the extractions were intended to alleviate it, or because one deciduous cuspid had been lost and an attempt was being made to restore symmetry (six patients). In four other patients both cuspids were lost prematurely. One patient offered no justification for extraction, and none was performed. At intervals of about 18 months, the complete examination was repeated for each child. The following conclusions were reached:

1. The premature removal of deciduous cuspids had no adverse effect on ultimate intercuspal width.

2. When the premature removal of deciduous cuspids was indicated, placement of a lingual arch appliance had dubious value in this series of patients, whether to prevent lingual positioning of incisors or to prevent the forward positioning of molars. Lingual arch appliances are useful where second deciduous molars are lost or where their loss is imminent.

3. Arch length shortens during the transition from the mixed to the permanent dentition. The basis for this shortening differs in different persons. In most instances, the shortening can be attributed more to a lingual shifting of incisors on the symphysis than to a forward shift of molars.

4. Prediction of arch length deficiency in the permanent dentition, based on measurements made during the mixed dentition, is sufficiently inaccurate so that caution should be exercised in applying such predictions clinically. Although the mesiodistal widths of unerupted cuspids and bicuspids may be predicted from measurements of incisors with more accuracy than from corresponding measurements in poor intraoral films, measurements made from films taken with a meticulous technic are the most accurate. Whether films or formulas are used, however, appreciable errors in prediction can occur.

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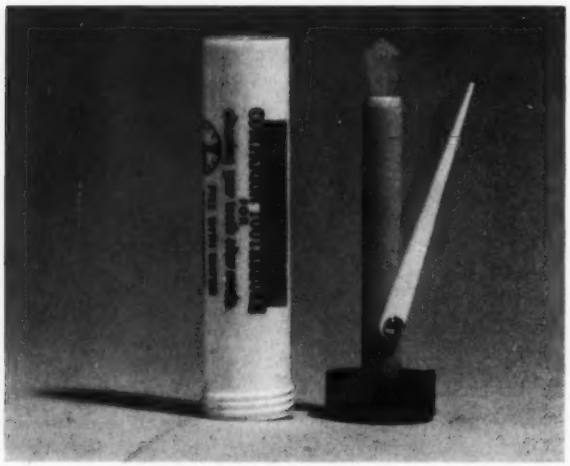
Periodontics

Letter to the editor [small toothbrushes]

H. G. Orlay. *D.Practitioner* 8:279 May 1958

The most gratifying results of periodontal treatment are only temporary if the patient's future cooperation is not obtained. Instruction of the patient in the correct use of the toothbrush, and so forth, is as important as is dental treatment.

For the past three years the author has recommended the use of two effective devices well



received by patients. They are supplementary small toothbrushes. Many patients who are reluctant to use wooden sticks regularly will accept readily the suggestion to clean and rub the interproximal spaces and the marginal gingivae with these little brushes, and will persevere with this form of self-treatment.

The two brushes are complementary. One consists of a plastic container the size of a lipstick container, holding a combined small nylon toothbrush and a plastic toothpick. The handle of the brush is fixed to the lid of the container and is ready for use when removed from the container (illustration). The toothpick is hinged to the handle and can be turned away from it; thus, both toothbrush and toothpick can be used without interfering with each other. The container is watertight. It is kept filled with fresh water which should be renewed once or twice daily. A drop of antiseptic mouthwash can be added to flavor the water. The brush need not be rinsed after use. The brush is shaped as one large tuft. Its bristles are beveled towards the periphery, so that the brush may be easily pushed into the interproximal spaces.

The second brush consists of a similar large tuft fixed to a long contra-angle handle, and also has a hinged plastic toothpick. This brush is handy for use in rubbing and scouring the more inaccessible areas of the lingual surfaces of the teeth. It perhaps provides the only means to clean the distal surfaces of molars and the marginal areas of teeth with severe lingual tilts.

The patient is advised to use the contra-angled brush at home, and always to carry with him the small straight brush and to use it after each meal. The container can be easily carried in a handbag or pocket.

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Extreme paleness of the gingivae

Zahnärztl.Praxis 9:113 May 15, 1958

Q.—The patient, a 20 year old woman, showed extremely pale (almost white) gingivae in the upper and lower jaws. Recently, all her anterior teeth, especially those in the upper jaw, became somewhat loose. The first upper molars are missing (extracted) and in the lower first molars, endodontic treatment is in progress. Since her puberty, the patient has suffered from melancholia. Her history, however, revealed no other mental or physical disturbance. Gingival massage did not improve the condition. What can be recommended to obtain an adequate supply of blood to the gingival tissue to produce normal color? What may be the cause of extreme paleness of gingivae?

A.—Unfortunately, information is lacking as to whether periodontosis or periodontitis is associated with the described condition. In each instance, however, a severe trophic disturbance must be taken into consideration. Internal and gynecologic examinations are indicated and also an investigation of the hormone metabolism. Only after the findings of these examinations are evaluated can local treatment by massage or short-wave irradiation be initiated. Topical application with nicotinamide may be considered in the treatment planning.

13b München-Gräfelfing, Germany

Congenital familial fibromatosis of the gums with the teeth as a probable aetiological factor: report of an affected family

Archibald McIndoe and B. Owen Smith. *Brit.J.Plast.Surg.* 11:62-71 April 1958

Fibromatosis of the gingiva is a fairly common condition, and may be due to local or systemic factors. Most instances are first seen in early childhood. The gingivae look normal at birth and start to enlarge as the deciduous dentition erupts. The degree of hypertrophy varies from the mild to the severe in which the hypertrophied gingivae conceal the teeth. Progress of the hypertrophic process usually is accelerated when the permanent teeth erupt. There is no tendency to regression; progression is the rule (Weski, 1920). The hypertrophied tissue is firm or hard to the touch and may become papillomatous in extreme instances. The enlargement usually affects both the maxillary and mandibular gingivae—usually, the former to a greater extent than the latter. Pain is not a symptom and bleeding from the enlarged gingivae is rare. The teeth usually are normal.

Case reports of an affected family are given, in which fibromatosis of the gingiva occurred in the father, daughter and son, the mother being free from the disease.

When the father was a child two years old, his gingivae began increasing in size. When he was 19 years old, maxillary and mandibular gingivectomies were carried out; one month later the gingivae began to hypertrophy again. When the father was examined at age 42, there was enormous hypertrophy of both maxillary and mandibular gingivae. His teeth were discolored and coated with dirty deposits. He had sought advice for the treatment of his daughter, who had developed the same disease beginning at age two. When the daughter was five years old, total gingivectomy, extraction of all deciduous and permanent teeth, and partial alveolectomy, were carried out, and dentures were fitted. Five and a half years later the gingival hypertrophy had not recurred.

The same disease developed in the son. When he was three and a half years old, his gingivae were excised and all deciduous teeth removed. When the permanent dentition erupted, the disease recurred, and he received the same course of treatment as had been given his sister.

The three case reports show three aspects of the disease: (1) the natural course of the disease when untreated, as in the father; (2) the tendency to recurrence if both permanent and deciduous teeth are not removed, as in the son, and (3) the satisfactory result attainable when treatment is radical, as in the daughter and later in the son.

The etiology of the disease is uncertain. Most writers are agreed on its congenital and hereditary nature. The association of hypertrophy of the gingivae with the development and presence of the teeth was the major feature noted in the family discussed. The hypertrophy was most severe in the immediate vicinity of each tooth. The fact that hypertrophy recurred with eruption of the permanent dentition suggests that in some way it is the teeth which ultimately give rise to the enlargement of the gingivae.

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Some observations on the reliability of the P.M.A. index

G. T. Hutchinson. *Austral.D.J.* 3:97-100 April 1958

In 1956, 100 fifth grade children in the age range of 9.5 to 10.5 years were examined and the number of inflamed units associated with the six maxillary and six mandibular anterior teeth was recorded, using the modified PMA index sug-

gested by Massler, Cohen and Schour (1952). The children were re-examined within a week and the scores again recorded. In 1957, 110 children in the same grade were similarly examined.

An inspection of the results showed that almost no child received the same score from both examinations. To estimate the reliability of the PMA index, a person product-moment coefficient of correlation was calculated and found to be similar for both series of tests (+ .73 in 1956, + .74 in 1957).

It was concluded, under the conditions of this experiment that (1) the PMA index has a limited ability to describe the gingival condition of an individual, and (2) differences in average PMA scores for small groups must be interpreted with caution.

Commonwealth Department of Health, Canberra, Australia

Incisal relationship and periodontal disease

R. D. Emslie. *Parodontol.,Zürich,* 12:15-22 May 1958 [in English]

The theory that excessive incisal overbite (vertical) and excessive overjet (horizontal) are predisposing factors in the development of periodontal disease has been suggested by several authors. The height of the crowns of incisors and the distance between the marginal gingivae of upper and lower incisors also may play an important role.

The present investigation was carried out at the dental department of Guy's Hospital in London. A comparatively large number of patients referred for periodontal treatment were examined, and the data obtained were compared with data arrived at by observation of healthy periodontal tissues in dental and medical students. It was hoped to be able to demonstrate whether any of the assumed causative factors play a significant part in the etiology of periodontal disease.

Measurements were taken with millimeter rules and calipers of the incisal relationship in 804 patients accepted for treatment of periodontal disease. The distances measured were as follows: (1) the maximum distance between the marginal gingivae on the labial side of the upper and lower central incisors in an edge-to-edge occlusion; (2) the maximum distance between the marginal gingivae in centric occlusion, and (3) the minimum distance between the labial surfaces of the upper and lower central incisors in a centric occlusion.

The amount of incisal overbite appeared to be an unimportant etiologic factor in periodontal disease. It was noted, however, that in a few instances in which extreme overclosure caused traumatization of incisors, gingivitis and recession occurred.

An extreme horizontal overjet appears to be a significant causative factor.

It can be assumed that long crowns of incisors, and an excessive distance between the upper and the lower labial gingivae—when the teeth are in centric occlusion—may be predisposing factors in ulceromembranous stomatitis (Vincent's disease).

Increased stagnation of food debris around the gingival margins which are too far from the incisal edges of the anterior teeth to benefit from the self-cleansing action of salivation or mastication may be the causative mechanism.

The data obtained, however, do not reflect the incidence of periodontal disease in the general population of England; they probably demonstrate that certain types of periodontal disease, especially Vincent's disease, chronic gingivitis, chronic hyperplastic gingivitis, periodontitis and periodontosis, are more often referred by dental practitioners for hospital treatment than other types of periodontal disease.

Nevertheless, the comparatively small number diagnosed as periodontitis complex or as periodontosis—baffling conditions which require extensive treatment if the teeth are to be saved—suggests that the incidence of these complicated periodontal diseases is very low.

The greater number of men than women with Vincent's disease probably reflects a higher incidence of poor oral hygiene among men than among women. The reverse finding in chronic gingivitis may be caused by the fact that women demand treatment at an earlier stage of this disease than men.

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Oral surgery

Frenoplasty

John H. Lee and David Downton. *J.Pros.Den.* 8:19-21 Jan. 1958

The labial and buccal frenums frequently are associated with the problem of developing and maintaining adequate retention in upper and lower complete dentures. The dense, fibrous strand of tissue in the frenums has not the elastic property of the adjacent connective tissue. Therefore, this frenular tissue is unsuitable for producing the required elastic strain necessary to prevent the effect of atmospheric pressure from operating on the inner surface of the denture.

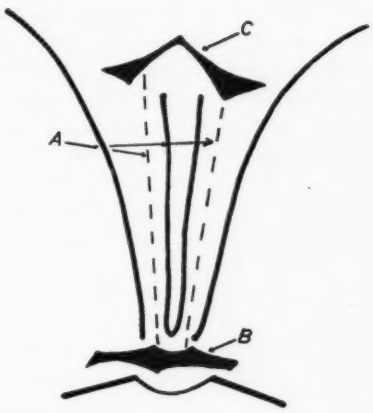
These frenums have been termed "muscle attachments" by some authorities. The authors have dissected a number of frenums and find them to consist of a strand of fibrous tissue, covered with mucous membrane, extending from the soft tissue of the lip or cheek to an attachment on the alveolar process.

In instances where it has been considered advisable to remove these frenums, the following technic has been used successfully:

The lip or cheek is pulled out so that the frenum is taut. The underlying fibrous tissue then can be seen stretched and extending from the soft tissue of the lip to the alveolar process.

Vertical incisions (see illustration) are made through the mucous membrane on each side of the fibrous strand down to, but not penetrating, the periosteum and leaving mucous flaps on each side (A in illustration). A third incision (B) is made connecting the first two incisions at the alveolar process below the point of attachment. The fibrous strand then is dissected and a further V-shaped incision (C) made to separate the base of the frenum from the lip or cheek.

The first, or "anchor," suture is inserted at the level of the junction of the mucous membrane and the mucoperiosteum of the alveolar process. The needle is passed through one mucous membrane flap, then under the periosteum, and through the mucous membrane flap of the opposite side. This ensures that the two mucous membrane flaps are held firmly to the periosteum at the height of the vestibular sulcus. Further suturing of the soft tissue of the lip or cheek then is carried out as necessary.



The incisions for removing the frenum. A, the vertical incisions. B, the lower horizontal incision. C, the incision to separate the frenum from the lip or cheek

If the patient has a denture, it may be lined with zinc oxide-eugenol paste and inserted; this will help to keep the damaged tissue at rest and promote rapid healing.

Frenums up to 1.0 cm. wide have been removed satisfactorily with this technic, but care must be taken not to penetrate the periosteum with the incisions, and to place the first suture correctly. No attempt should be made to suture the mucoperiosteal part of the incision.

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Lesions of the salivary glands

D. G. McEachen, D. F. Moore, E. M. Nanson and T. A. Watson. *Surg.Gynec.& Obst.* 106:655-666 June 1958

Of the major salivary glands, namely, the parotid, the submaxillary and the sublingual, the sublingual gland rarely gives rise to trouble, and when it does it presents no particular problems in ther-

apy because its removal is not especially difficult. The submaxillary gland is subject to both inflammatory lesions and tumor formation. Of these two conditions, inflammation is the more frequent and is commonly associated with stone formation. The submaxillary gland is chiefly of interest because of calculus formation, whereas the parotid gland is chiefly of interest because of tumor. The submaxillary gland does not present a problem surgically, and little attention is given to it because it is readily excised without harm to the patient.

With the parotid gland, however, both the benign and the malignant varieties of tumor are pleomorphic, the histologic appearances are of consuming interest, and both have a distressing habit of recurring. The parotid gland cannot be as readily excised with as little disability to the patient as with excision of the submaxillary gland. The intimate association of the facial nerve with the parotid gland is the cause of the difficulty; this leads to diffidence on the part of the surgeon; as a result, inadequate incisions are used, inadequate removal of the tumor is done, and recurrence is frequent.

Of 155 lesions of the salivary gland seen in the Saskatoon Cancer Clinic from 1932 to 1956, 129 were neoplasms; of these, 79 were benign mixed tumors. In this series, benign mixed salivary tumors had an over-all recurrence rate of 6 per cent. Patients with malignant tumors had an over-all five year survival rate of 65 per cent.

A lump in the parotid gland should be regarded in the same way as a tumor of the breast. It should be excised with normal gland tissue surrounding it, and a frozen section examination carried out. Although good results have been obtained with local excision, or enucleation, plus radiation, the results would be still better if a more aggressive and a more anatomic type of operation were performed in all these tumors. A better surgical method would appear to be that advocated by Janes, that is, wide excision of all parotid tumors with visualization of the facial nerve; if malignancy is found, then total parotidectomy with preservation of the facial nerve should be attempted. Postoperative radiation is effective in benign and malignant tumors of the parotid gland, it does no harm to the patient, and it should be used as an adjunct to surgery.

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Osteosynthesis in treatment of fractures of the jaws or facial bones

Zdeněk Vejrosta. *Československ.stomat.* 58:67-70 April 1958

Fractures of the jaws or facial bones are generally due to trauma. Pathologic fractures of these structures, however, may occur if the bones have become fragile as from tumors and cysts, infections such as osteomyelitis and tertiary syphilis. Many skeleton diseases predispose to fracture. There is usually an exciting cause. Occasionally, the patient is not aware of the occurrence and cause of fracture, especially in the instance of extensive tumor where the tumorous mass gives the bone a certain amount of strength and support.

Traumatic fractures of the jaws or facial bones are caused by accidents which are on the increase in recent years and involve today almost as many women as men.

In fractures of the jaws the patient is unable to occlude his teeth in normal position; mastication and movement of the jaws are limited and painful. Severe laceration of the facial skin, injury to the mandibular nerve, dislocation of the fragments and damage to the teeth frequently are associated with these fractures. Trismus is common in fractures at the angle of the jaws and condyles. Many other complications may occur such as hemorrhage, ptyalism, osteomyelitis with sequestration and formation of abscesses or fistulas. The most serious complication, however, is malunion. It results in malocclusion and malposition of the ramus, and may be due to local or systemic factors.

Roentgenographic examination should be thorough and include anteroposterior and lateral views of the skull and jaws, and special exposure of the condyles and coronoid processes (anteriorally and laterally). Intraoral films of the teeth are of importance if the type of fracture and its complication permit taking such films. As important as taking good roentgenograms is their correct interpretation.

Osteosynthesis, the fastening of the fragments together by mechanical means such as wires or plates, was the method of choice in the treatment of 20 patients at the Dental School of the Uni-

versity of Brno, Czechoslovakia. An almost perfect stabilization of the fragments in correct position was obtained by using Kirschner wires. Osteosynthesis proved to be the simplest method to use in fractures of edentulous jaws. Skeletal fixation with wires and plates facilitates the stabilization of the edentulous fragments. This method is favored in the majority of instances because it allows the patient to open his mouth during the period of treatment. Osteosynthesis, when suitable material and a careful surgical technic are used, eliminates the application of headbands and headcaps which frequently are uncomfortable for the patient.

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The treatment of parotid tumours considered in historical perspective

David H. Patey. *Irish J.M.Sc.* No. 387:120-124 March 1958

Although the clinical features of inflammatory lesions of the parotid gland were early recognized, the anatomy of the gland was almost completely ignored during the classical and medieval period. Galen did not mention the parotid glands. Ambroïse Paré described the parotid glands as the "emunctories of the brain." Vesalius (1543) in his first edition of *De Fabrica* illustrated and described the parotid gland; he did not mention the duct, which was not described until more than a hundred years later by Stenson (1664). With the discovery of the duct, the function of the parotid gland as one of a group of salivary glands became obvious.

By the end of the eighteenth century the converging development of anatomy, physiology, organ pathology and surgery reached a stage at which the surgical removal of parotid tumors became possible. One of the best known early accounts of parotidectomy is that of J. C. Warren, Jr. (1837), describing an operation which he had carried out 16 years previously. The best and most detailed account of an early parotidectomy is that published by Carmichael of Dublin in 1818.

The development of anesthesia, and later, of antisepsis, led to the possibility of a more systematic attack on the problem. The standard approach to parotid tumors in the latter part of the nineteenth and for most of the first half of the present century had two main characteristics: (1) hesitation in advising operation and (2) if operation was carried out, limitation of the operative procedure. Except for obvious instances of carcinoma, enucleation became the standard operation. The main development in treatment in the early decades of the twentieth century was the use of irradiation, either preoperatively or postoperatively, in an attempt to cover the technical deficiencies of surgery.

Occasionally, surgeons expressed dissatisfaction with the standard surgical treatment. Carwardine (1907) recorded a total parotidectomy with preservation of the facial nerve, for a recurrent mixed tumor. Von Haberer (1910) and Burckhardt (1923) each recorded a single instance of a similar operation for hemangioma. Duval (1914) advocated the routine sacrifice of the inferior main division of the facial nerve as part of a total parotidectomy for tumors. From the Mayo Clinic, Sistrunk (1921) and Adson and Ott (1923) described technics of identification of the facial nerve as a preliminary to a wider removal of certain categories of parotid tumor. In the early 1940's, three surgeons independently advocated the practice as a routine of parotidectomy with preservation of the facial nerve: Janes of Toronto (1940), Hamilton Bailey of London (1941), and Redon of Paris (1942). Some form of conservative parotidectomy has largely replaced enucleation as the standard treatment for parotid tumors. Complete anatomic preservation of the facial nerve is almost always possible, with care. With such preservation, complete recovery of function always occurs, though a brief phase of partial or complete facial palsy may occur. In recurrent mixed tumors, cylindromas, muco-epidermoid tumors and carcinomas, in which infiltrative growth is present, sacrifice of part of the nerve may be necessary.

The scar of parotidectomy, though necessarily a long one, should become almost invisible if properly planned. The only two unavoidable sequelae of parotidectomy are the hollow at the site of the removed parotid gland and gustatory sweating. Such sweating on eating (the parotid variety of which occurs in the auriculotemporal

region) is not peculiar to parotidectomy, but may occur after any operation on or injury to the parotid gland. There is no permanent curative treatment, but the disability usually is minor.

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Postoperative edema in maxillofacial surgery: prevention and treatment with promethazine

Paul R. Wohlgemuth and Gerald R. O'Brien. *Am.J.Surg.* 94:537-541 Oct. 1957

A series of 40 patients (27 males and 13 females), with a median age of 30 years, received promethazine hydrochloride before and after maxillofacial surgery. For 90 per cent the compound was administered orally in a dose of 25 mg. the night before operation, one hour before induction, and each night thereafter throughout the postoperative period. The remaining 10 per cent of patients, admitted for immediate operation, received 50 mg. intramuscularly one hour prior to induction; the same dose was repeated by the same route every 12 hours for the first two postoperative days. Analgesic and amnesic medication and antibiotics were used as indicated.

The influence of the medication on the degree of postoperative edema after a given procedure depends on so many variables that the results of any such measures must be evaluated solely on the basis of clinical impressions and comparisons with previous observations of similar surgical patients for whom the agent was not used. In this study, postoperative edema and other common sequelae were graded as follows: none, 0; slight, 1+; moderate, 2+, and severe, 3+.

The majority of earlier patients treated by various other methods exhibited moderate to severe edema. The over-all picture in this series, however, indicated that promethazine exerted an antiedemic influence in the dosages used. The results were excellent in some instances and less pronounced in others, but all compared favorably with the degree of control of edema previously obtained with local injections of hyaluronidase at the operative site.

Of the 40 patients, 7 per cent had no edema; in 84 per cent there was slight swelling; in 4.5 per cent, a moderate degree of edema, and in 4.5 per cent (who underwent open reduction of a fractured mandible), swelling was severe.

Medication with promethazine significantly reduced the incidence of postoperative nausea and vomiting.

Promethazine exerted no analgesic action but tended to minimize the patient's discomfort by its strong sedative action. It did not influence postoperative bleeding and had no adverse effect on the rate of healing.

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Epidemiology of wound infection after oral surgery

Richard Lautermann and Ludwig Grün. *Deut.med.Wschr.* 83:922-924 May 23, 1958

An unusual outbreak of postoperative sepsis (after oral surgery) occurred in six patients of a ward of the Dental Hospital of the Medical Academy of Düsseldorf, Germany.

In this surgical unit, a survey of wound infections had been started recently—not because of any suspicion that the incidence was comparatively high, but to ascertain the type and the cause of the infection.

Bacteriologic and serologic typing of the staphylococci obtained from each afflicted patient revealed that the same strain was responsible for the postoperative sepsis in each instance.

Staphylococcus pyogenes var. *aureus*, the causative anaerobic microorganism, was characterized by a blood group B antigen, and was found extremely resistant to penicillin and streptomycin.

The same strain was later isolated from the nose, throat and hands of a number of attendants and nurses. It was found in the air of the operating room and the ward, and in the bedding of all ward patients.

One of the oral surgeons, who had been in close contact with the six infected patients, was found to be an unknowing but chronic carrier of the pathogenic microorganisms.

It seems certain that other similar staphylococcic outbreaks must have occurred without their existence and source being recognized and investigated.

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Pathology

Lichen planus of the mouth

R. P. Warin, H. S. M. Crabb and A. I. Darling. *Brit.M.J.* No. 5077:983-984 April 26, 1958

It does not seem to be realized generally that lichen planus can occur in the mouth without any cutaneous eruption. In the period from 1950 to 1957, 45 patients with lichen planus of the mouth were seen by the authors. Five to six times as many patients with cutaneous lichen planus were seen in the same period.

The patients were followed up at a combined dental and dermatological clinic. The condition cleared completely in only 4 patients: in 2 after 14 years; 1 after 2 years, 1 after 6 months. Four other patients had minimal lesions after 10, 5, 3 and 2 years, respectively. If the history and period of observation are taken together, the condition was still present after 10 years in 2 patients; between 5 and 10 years in 5; between 3 and 5 years in 7, and between 1 and 3 years in 15; and under 1 year in 8. When the condition cleared, the affected mucosae became normal except on the dorsum of the tongue, where permanent smooth patches usually remained, and at the sites of previous ulceration slight scarring sometimes was apparent.

The age distribution of the 45 patients was as follows: third decade, 4 patients; fourth decade, 6 patients; fifth decade, 13 patients; sixth decade, 17; seventh decade, 4, and eighth decade, 1. In six patients the condition was symptomless, the mouth lesions being noticed by the dentist or physician. Twelve complained of roughness or dryness, and two of a metallic taste. Thirty had pain at times which was associated with ulceration. Periods of dysphagia occurred in two patients. Dentures were worn by 33 patients, but there was no relation between the time of onset and the provision or change of dentures. No association between the extent and distribution of the lesions and smoking habits was noted. Twenty-four patients gave a history of nervous breakdown, persistent insomnia or depression, and most patients appeared to be of a nervous, sensitive temperament. Seven had had major worries or strain immediately prior to the onset.

The areas affected were the inner aspect of the cheek in 34 patients, tongue in 29, lips in 15, gingival margins in 8, and palate and fauces in 3. In these areas the commonest sites for the lesions were opposite the occlusal line on the cheek mucosa, on the dorsum and posterolateral margins of the tongue, and close to but just short of the gingival margins. The lesions consisted of discrete or confluent white spots of pinhead size, white streaks, and, less commonly, white patches up to 2 cm. in diameter, which showed spots or streaks at the edges. The white streaks often were curved, sometimes annular or reticular, and in some instances they were present in the buccal sulcus where the edges of dentures impinged. Ulceration occurred at times in 30 patients.

There is no specific treatment of the condition. Explanation and reassurance, simple psychotherapy, and the use of sedatives and other general supportive treatments have been employed. The condition improved in some patients after treatment with arsenic, thiamine hydrochloride, or injections of cyanocobalamin; but when assessing the value of these treatments it is impossible to exclude the effects of suggestion or the natural fluctuations in the course of the disease. It is clearly important to reduce trauma from sharp teeth or rough dentures, particularly in the presence of ulceration. The reduction of secondary infection by mouthwashes of chlortetracycline hydrochloride every few hours appeared to help in some patients with severe ulceration.

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Oral manifestations of leukemia

John H. Duffy and Edward J. Driscoll. *Oral Surg.,Oral Med.& Oral Path.* 11:484-490 May 1958

Oral mucosal changes, a disagreeable manifestation of leukemia, were studied periodically for 18

months in 38 patients—9 with myelogenous leukemia and 29 with lymphogenous leukemia. In 23 patients (60 per cent) the white blood cell count was consistently subleukemic, probably due to treatment with antimetabolites and steroid drugs. Severe thrombopenia was noted in 84 per cent of the patients.

Of the 38 patients, positive oral findings were noted in 80 per cent. The eight patients with no oral pathologic findings were either very young or edentulous. The shallow gingival sulcus and scant calculus formation in the young, and the absence of interdental irritation in edentulous patients, appear to minimize oral difficulties.

Oral changes in six classifications were recorded. The incidence of each among the 38 patients was as follows: nonspecific gingivitis, 53 per cent; hypertrophic gingivitis, 45 per cent; necrotizing ulcerative gingivitis, 3 per cent; bleeding, 42 per cent; ulcerations, 39 per cent, and petechiae or localized ecchymoses, 35 per cent.

The low incidence of necrotizing ulcerative gingivitis in this series is due primarily to the antibiotic therapy so often given these patients.

The maintenance of good oral hygiene in leukemia patients probably reduces the oral manifestations. Particular attention should be given the interdental regions, with periodic removal of calculus and with prophylaxis. Prophylaxis should be done first whenever the patient is reasonably comfortable and should be repeated at regular intervals as long as practicable.

Once leukemic infiltration of the gingival tissues occurs, with concurrent gingivitis, palliative treatment with topical methylrosaniline chloride (gentian violet) has been reasonably effective. This drug also has been used effectively to reduce the pain and infection in oral ulcerations.

Framingham, Mass.

Multicentric carcinomas of the oral cavity

Charles G. Moertel and Edward L. Foss. *Surg.Gynec.& Obst.* 106:652-654 June 1958

The idea that epithelial carcinoma originates from a single minute focus at a single instant in time has been challenged in recent years by the idea of the multicentric origin of epithelial carcinoma. Many of the basic observations underlying the idea of multicentric origin of epithelial malignancy have been made in the study of carcinoma of the oral cavity.

Of 732 patients with proved oral cancer seen at the Mayo Clinic during the ten year period from 1944 through 1953, 64, or 8.7 per cent, were found to have two or more discrete oral cancers. All lesions were squamous cell carcinomas. Of the 64 patients, 21 had simultaneous lesions and 43 had lesions occurring at intervals ranging from 1 to 25 years, the average interval being 7.1 years. Of the 64 patients, 48 (75 per cent) had leukoplakia. Of the 49 men among the 64 patients, 46 (94 per cent) were users of tobacco, and of these, 22 (48 per cent) either smoked cigars or chewed, thus repeatedly bathing the mouth in tobacco juices.

That the tendency to multicentricity in oral carcinoma is not limited to the oral cavity alone but extends to the contiguous squamous cell mucous membrane is evidenced by the fact that an additional 55 of the 732 patients with oral cancer had associated epitheliomas of the lips, pharynx, larynx or esophagus. Thus, the over-all occurrence rate of multicentric cancer for the 732 patients is raised to 16.4 per cent.

When oral cancer develops, all of the contiguous squamous cell mucous membrane must be considered as highly susceptible to future malignant change. Frequent and regular follow-up examinations must be made so that any second lesion may be detected and treated in its early stages. Appropriate prophylactic measures should be initiated to eliminate any possible sources of carcinogenic irritation to these regions.

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Cause and treatment of bruxism and bruxomania

Heinz Bober. *Österr.Zschr.Stomat.* 52:449-453 Sept. 1957

Four thousand persons, between 25 and 40 years old, were observed in specially reserved wards at the Institute for Research on Human Physique and Physical Characteristics of the University of Heidelberg.

The studies were designed to determine whether a relation exists between occlusion (malocclusion) and habitual bruxism or bruxomania.

Four patient groups were formed: (1) men with normal occlusion; (2) men with various types of malocclusion; (3) women with normal occlusion, and (4) women with various types of malocclusion. None of the patients with malocclusions had had any type of orthodontic treatment prior to the study.

In Group I, 68 (6.8 per cent) had bruxism and 2 (0.2 per cent), bruxomania; in Group II, 184 (18.4 per cent) had bruxism and 16 (1.6 per cent), bruxomania; in Group III, 18 (1.8 per cent) had bruxism and 12 (1.2 per cent), bruxomania, and in Group IV, 122 (12.2 per cent) had bruxism and 128 (12.8 per cent) bruxomania.

It seems significant that bruxism occurred more frequently in men than in women, and bruxomania more frequently in women than in men. The data obtained seem to indicate that a definite relation exists between bruxism or bruxomania and the presence of malocclusion.

All members of Groups II and IV were referred to the orthodontic clinic. After completely or at least partially successful treatment, the studies were repeated. The result is as follows: in Group II, bruxism was still apparent in 79 men (7.9 per cent), and in Group IV, in 41 women (4.1 per cent). Bruxomania, however, was seen in isolated instances only (far below 0.5 per cent).

The 79 men and the 41 women were then referred to the Institute of Psychotherapy. Follow-up examinations of these patients showed that in the great majority the habit of nocturnal grinding of teeth had been abandoned.

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Some observations on Costen's mandibular syndrome: including a review of 100 out of 500 cases

George T. Hankey. *Proc.Roy.Soc.Med.* 51:225-232 April 1958

Costen ascribed the following syndrome to temporomandibular joint dysfunction: (1) neuralgia of the second or third divisions of the trigeminal nerve; (2) pain in and around the ears; (3) stuffy sensation in the ears; (4) pain up the back of the head and down the side of the neck; (5) headaches, chiefly of the vertex; (6) sinus pains; (7) impaired hearing; (8) tinnitus, and (9) altered sensations of the tongue and throat, including a change of taste.

In a series of papers between 1934 and 1956, Costen enunciated the hypothesis that the symptoms were due to one or more of the following: (1) mandibular overclosure with distal condylar displacement and compression of the eustachian tube; (2) direct erosion of the roof of the glenoid fossa and the tympanic plate; (3) mesial pressure of the condyle on the chorda tympani, and (4) pressure of the retruded condyle on the auriculotemporal nerve. Anatomically these explanations were not substantiated by other investigators. Although Costen has modified his original views, and many of his concepts have since been found untenable, he has rendered a great service in pointing out the relation between malocclusion, temporomandibular joint dysfunction and facial pain.

A chance collection of 100 out of more than 500 cases of temporomandibular dysfunction treated by the author in the last ten years was analyzed. Of the 100 patients, 21 were male and 79 female. Twenty-eight per cent of the patients were in the age group 31 to 40 years, and 74 per cent of the patients were between 20 and 50 years old. Eighty-two per cent of the 100 patients had local symptoms which could be related by the patient to the temporomandibular joint or to mandibular function.

The ear symptoms described by Costen, except for pain, were almost nonexistent, but the neuralgias were real. Distressing facial, head and neck neuralgias without joint symptoms, but caused by mandibular displacement or muscular tension, were present in 18 of the 100 patients. Roentgenograms of the temporomandibular joint appeared normal in 34 per cent of the patients; 58 per cent showed abnormal condylar movement and 8 per cent showed pathologic changes. Three per cent of the patients were psychoneurotic and another 9 per cent suffered from a mild anxiety state. Some form of malocclusion was observed in 97 per cent of the patients. Seventy-nine per cent required prosthetic appliances. Eight per cent were helped by intracapsular injections

of hydrocortisone. Five per cent required meniscectomy. Twenty per cent required permanent onlays and another 30 per cent required trial onlays. Five of the 50 patients wearing movable onlay appliances developed superficial enamel caries beneath the onlays. Sixty per cent of the patients were cured, 34 per cent were much improved and 6 per cent remained unchanged. The average number of attendances for conservative treatment was eight, spread over a period of six months.

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Generalized intestinal polyposis associated with melanoplakia of the lips, oral mucosa and fingers: Peutz-Jeghers syndrome

R. Riterich and H. J. Kaufmann.
Schweizer.med.Wschr. 87:552-558 May 11, 1957

Dental and medical literature lists seven different types of hereditary multiple polyposis (Peutz-Jeghers syndrome): four sporadically occurring, possibly acquired, forms and three, usually malignant, familial forms.

Investigations carried out at the Massachusetts Memorial Hospital in Boston were concerned with one hereditary type which is transmitted as a Mendelian dominant by both sexes. In this type, the polyps may cover the entire small intestine and colon or be limited to pigmentation spots of the lips, the oral mucosa and the fingers. These melanin spots are always associated with malignant degenerative lesions occurring in the small intestine.

When Peutz first described this entity in 1921, he called attention to the triad of heredity, pigmentation and polyposis. Additional information was provided by Jeghers and his co-workers in 1949.

In the present study, 12 families have been found with more than one member showing the specific set of symptoms. Diagrams of the geneal-ogic tree of three of these families proved the occurrence of this syndrome in several successive generations.

The pigmentation appeared in the form of melanoplakia in the perioral region, the oral mucosa and on fingers and toes. The patches on and around the lips were comparatively small and resembled freckles. The spots appearing on the oral mucosa were larger. In some patients, pigmented patches were found on the skin of the face, especially around the nose and the eyes.

In children this progressive disease becomes manifest in recurrent episodes of invagination and hemorrhage. In adults, signs of malignancy such as bleeding and stricture are frequently the first observable symptoms.

The precancerous nature of the polyps and patches is proved by the frequent occurrence of carcinoma in the involved regions and by the multifocal development of other malignant tumors.

A dominant pleiotropic gene can be regarded as the cellular physiologic agent which causes this disease.

Massachusetts Memorial Hospital, Boston, Mass.

Epithelioma of the face arising from cicatrices caused by burns

A. Joserand, M. Dargent, J. Papillon and F. Pinet. *Presse méd.* 65:1479-1491 Dec. 1957

Sixteen instances are reported of epithelioma occurring on the skin of the face or the mucous membrane of the lips and the mouth, as a result of deforming scar contractions caused by serious burns.

In the majority of the patients, ranging in age from 27 to 66 years, the cicatrices impaired the movements of the jaws and masticatory function prior to the appearance of the malignant tumors.

In 10 patients, the interval between the initial burn followed by scar formation and the development of epithelioma varied from 15 to 55 years. In all instances, extensive cicatrization caused extreme facial deformities, superimposed on chronic infections. Periods of healing were followed by reulceration and secondary infection.

The appearance of epithelioma arising from recent cicatrices caused by facial burns is comparatively rare. Four such cases, however, are

reported in which the burns had occurred from one to six months prior to the tumor development. In three instances the burn was on the lower lip and was caused by lighting a cigarette. In one instance, the burn was near the angle of the mouth. These four patients were more than 45 years old.

Histopathologic examinations verified the initial diagnosis in all 16 instances. The tumor was squamous cell epithelioma.

Epithelioma, if it develops in cicatrices after burns, is extremely rare in patients less than 45 years old.

Any burn cicatrix on the facial skin or the mucous membrane of the lips or mouth that is subject to repeated trauma may undergo malignant degeneration. If the burn occurs in younger patients, the period between cicatrization and the onset of malignancy may be several years. In older patients, however, this time interval may be much shorter.

Radical surgical excision followed by electrocoagulation and roentgenotherapy resulted in permanent cure in 12 patients (80 per cent).

120 Boulevard Saint-Germain, Paris 6, France

Use of hamster cheek pouches in cancer chemotherapy

Dean F. Stevens and Erwin Schwenk.
Naturwissensch. 45:218 May 1, 1958

Previous experiments have demonstrated that the cheek pouches of golden hamsters offer a unique method for observation of transplanted oral tumors. The cheek pouch can be easily everted several times, and the growing tumor becomes observable under the microscope without upsetting the normal physiological condition.

For these reasons, the cheek pouch technic was used in investigations of several known chemotherapeutic agents at the Worcester Foundation for Experimental Biology in Shrewsbury, Mass.

The substances tested were: triethylenemelamine, azaserine, 3,6-*bis*-propoxy-2,5-*bis*-ethyleniminequinone and N,N,N″-triethylenethiophosphoramide.

The substances to be tested were ground in a hand homogenizer and a proprietary vehicle was used.

Male golden hamsters, which weighed about 100 Gm. each, were inoculated with a 1 mm. cube of a sarcoma induced by methylcholanthrene. The usual site of the transplanted tumor was the right cheek pouch. Twenty-four hours after implantation, the animals received the first injection. The tumors were transplanted on Monday, and the chemotherapeutic substances were injected daily except on Saturday and Sunday. The final injection was given ten days after tumor implantation so that each animal received a total of eight injections. Control animals were injected eight times with the vehicle only.

At four, seven and eleven days after the beginning of the experiment, the animals were anesthetized with veterinarian sodium pentobarbital, the cheek pouches were everted, and the size of the tumors measured by using an ocular micrometer in the eyepiece of a dissection microscope.

Since the implanted tumors grew in the form of ellipsoids, an approximate calculation of their volume was obtained by measuring length, width and height. The cube root of the figures obtained, when plotted against the number of days, resulted in a nearly straight line. Six golden hamsters were used as controls, and each substance was tested in six animals of the same strain. In all instances, the animals showed no weight loss during the experiments and remained active and healthy.

It was established that the transplanted sarcoma appeared to be sensitive to the four chemotherapeutic agents tested. The subcutaneous injection method appears to be more effective than an intraperitoneal administration.

The results, presented in diagrams, prove that the cheek pouches of golden hamster can be used effectively for implantation of oral tumors of various types and for testing chemotherapeutic agents. The direct measurement of the growing transplanted tumors allows accurate observation of the final size and evaluation of the growth rate and determination of the characteristic symptoms.

Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Anatomy

Roentgen ray diffraction studies of pulverized human dentin

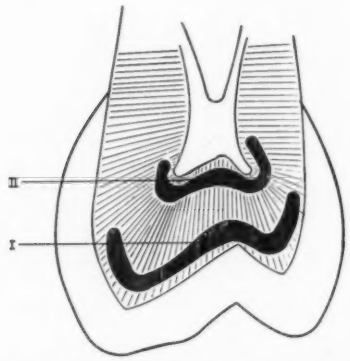
Per Torell. *Svensk tandläk.Tskr.* 51:137-144 March 15, 1958

The composition, size and dimensions of unit cells of inorganic contents of human dentin were studied by roentgen ray diffraction at the Anatomical Institute of the University of Göteborg, Sweden.

The study material was divided into the following three groups: (1) intact permanent teeth of school children of Göteborg; (2) intact deciduous teeth of preschool children of Göteborg, and (3) intact deciduous teeth of preschool children of Kållered.

The drinking water of Göteborg contains 0.3 ppm. fluoride, that of Kållered about 2.0 ppm. fluoride.

The dentin was separated and pulverized. Roentgen diffractograms were taken. Specimens from the coronal and the pulpal parts of the dentin were studied separately.



The coronal part (I) and the pulpal part (II) of dentin from which pulverized segments were taken and studied by roentgen-ray diffraction

The findings and conclusions were as follows:

1. Only the dentin apatite lines were fully recognizable in roentgen diffractograms. The positions of these lines were almost identical with those of the enamel apatite lines.

2. The dentin apatite in the coronal part appeared to be almost completely crystallized, that in the pulpal part was poorly crystallized. The established differences in composition, size and dimensions of the unit cells between the dentin of the coronal and that of the pulpal part seem to depend mainly on the variation in length of the developed crystals.

3. The unit cell dimensions for completely crystallized dentin apatite were established as: coronal part = 9,440 A $\pm$ 0.005, and pulpal part = 6,881 A $\pm$ 0.005. For the unit cell dimensions of incompletely crystallized dentin apatite, only probable values of little accuracy could be estimated.

4. Because no significant differences could be found by roentgen ray diffraction among the three groups, the study could not serve as evidence of a possible influence of fluoride-containing drinking water on the composition of inorganic contents of dentin of deciduous teeth.

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Mandibular torus

Paul Courturier. *Rev.franç.odontostomat.* 4:1205-1210 Oct. 1957

The mandibular torus, an exostosis often observed on the anterior, lingual aspect of the lower jaw opposite the mental foramen, is no morbid formation and therefore no disease. It also occurs too frequently to be called an abnormality.

The presence of mandibular torus, which usually occurs bilaterally, does not interfere with normal functions of mastication or speech, but it sometimes impedes the movements of the tongue. If a large mandibular torus is present, extending from the bicuspid region to the lateral incisor, the fitting of dentures may become difficult. In such instances, surgical removal is indicated.

The growth of a mandibular torus is extremely slow. The bony prominence often becomes noticeable after the patient has reached middle age.

Although the etiology of mandibular torus is unknown, the following three theories have been presented:

1. The atavistic hypothesis is based on Lair's findings that the mandibular torus was found in the majority of skulls of primitive man. According to this hypothesis, the mandibular torus in prehistoric man served as the starting point for the masticatory muscles.

2. The functional hypothesis postulates that an extreme and progressive attrition must produce a shifting of the masticatory act from the anterior to the posterior region, thereby promoting the formation of bilateral exostoses on the surface of the lower jaw. Ackermann calls this structural transformation a "functional metamorphosis."

3. The racial theory is based on the assumption that mandibular torus occurs far more frequently in northern than in southern people.

Anthropologic findings seem to support the third theory. The statistical data given are as follows: (1) mandibular torus occurs in from 42 to 97 per cent of pure Eskimos; (2) in from 20 to 22 per cent of Lapps; (3) in from 26 to 68 per cent of Aleuts, but (4) in only 5 per cent of Chinese. All these races are of Mongoloid origin.

Aix-les Bains, France

Growth of the human cranial base

E. H. R. Ford. *Am.J.Orthodont.* 44:498-506 July 1958

Roentgenographic cephalometry requires a stable plane in the base of the skull for the superimposition of successive roentgenograms of the growing skull. Hitherto, the nasion-sella line has been most favored for this purpose. The development and growth of the face are intimately related to those of the cranial base.

The growth of the anterior part of the cranial base was studied by measurements on a series of 66 immature skulls arbitrarily grouped by the state of dentition into seven groups.

The observation by de Coster (1951, 1952) that the distance from sella turcica to foramen caecum does not increase after eruption of the first permanent molars is confirmed. The cribriform plate completes its growth as early as the end of the second year.

Individual segments of the cranial base follow either the neural or the general skeletal pattern of growth, but not an intermediate pattern. Between nasion and the posterior margin of the foramen magnum are four regions with different growth rates. The first (from nasion to foramen caecum) and the third (from sella turcica) have the general skeletal growth rate. The second (from foramen caecum to sella turcica) and the fourth (from the anterior margin to the posterior margin of the foramen magnum) have the neural growth rate.

Since the cribriform plane (the plane of cribriform plate and jugum sphenoidale) is immutable after eruption of the first permanent molars, it would form an excellent base line for the study of facial growth during eruption of the permanent dentition, and one theoretically better than the nasion-sella line normally used.

In practice, superimposition of roentgenograms on a nasion-sella line has given satisfactory results. Probably the satisfactory results are due to the fact that both nasion and sella rise in relation to the cribriform plane, but that the line remains relatively parallel to the cribriform plate since both its ends are raised by about the same amount. If this is so, studies of facial growth which employ this base line will give a slightly excessive estimate of the vertical growth of the face in comparison with forward growth. Provided this possibility is realized, there is little theoretical objection to the employment of the nasion-sella line.

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A profile roentgenologic study of a series of medieval skulls from Northern Sweden

Lennart Lysell and Rune Filipsson. *Odont.Tskr.* 66:161-174 April 1958 [in English]

An investigation was undertaken to study, with the help of profile roentgenograms, the skeleton of the jaws and face in a series of medieval skulls from Northern Sweden, and thereby to ascertain: (1) whether attrition had produced any changes in these parts of the skeleton, and (2) whether

the material showed any deviations from present-day material in other respects. The material consisted of 65 skulls (36 male and 29 female) from the so-called Västerhus material (Lysell, 1958); the material included all those skulls selected by Lysell for dental investigation and which were sufficiently undamaged to be placed in a cephalostat. The material was divided into two groups, one with slightly abraded teeth and one with severely abraded teeth, classified according to the method described by Lysell.

A comparison of the skulls in the two groups indicates that attrition affects the angle between the maxillary central incisor, the sella turcica and nasion, the angle decreasing with increasing attrition. The presumed cause is the strong pressure exerted by the muscles of the lips and cheeks.

The investigation does not support the view, sometimes expressed in the literature, that in attrition the lower jaw is shifted anteriorly with a resulting decrease in overjet. It was not possible to establish any significant forward displacement of the lower apical base point (the intersection point of the profile line and the longest line normal to the profile from the line joining the pogonion and the infradentale) or of the mental prominence. On the other hand, it is probable that the decrease in overjet that can be observed in a comparison between old and young individuals in the cranial material is due to an inward, backward displacement of the crowns of the upper incisors.

Although attrition could be expected to produce a reduction in facial height, this does not seem to have occurred. A possible explanation is that, under the influence of severe attrition, the teeth continued to erupt.

The investigation affords no evidence of other changes in the facial skeleton as a result of attrition. Sex differences with a varying degree of significance were noted for seven criteria; with one exception (angle between the upper and lower incisors), they derived from linear measurements, consistently higher values being found in males than in females.

The greatest deviation from present-day material was noted with respect to the angle between the upper incisor, the sella turcica and nasion.

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Anesthesia and analgesia

Facial paralysis after mandibular regional anesthesia

C. M. E. Eugster. *Schweiz.Mschr.Zahnhk.* 68:302-305 April 1958

In the human face, the motor nervous system consists mainly of the branches of the fifth (trigeminal) nerve supplying the elevator muscles of the jaws and the seventh cranial (facial) nerve supplying most of the other facial muscles. If one of the motor nerves is deprived of function, complete facial paralysis results; if function is impaired, partial facial paralysis occurs.

Facial paralysis usually is caused by disease of the peripheral nerve branches associated with acute infection of the respiratory tract. Occasionally, paralysis of the facial nerve is caused by surgical trauma or regional (nerve block) anesthesia involving one of the facial motor nerves.

In the case reported, the patient, a 17 year old boy, showed the characteristic signs of facial paralysis almost immediately after mandibular regional anesthesia in which "Malaestin," 4 per cent, was injected. Extirpation of the pulp of the lower left second molar was performed. There was dysfunction of the maxillary musculature, inability to wrinkle the forehead, inability to close the left eye, and the patient's mouth was drawn to the left side and could hardly be closed. Speech defects occurred, the patient being unable to pronounce clearly certain letters.

The patient was referred to a neurosurgeon for treatment but he did not keep his appointment, claiming that spontaneous recovery had taken place. This was verified during the next periodic dental examination.

This case report may be regarded as confirmation of the hypothesis that facial paralysis can be caused by regional anesthesia involving one of the motor nerves, even if the injection needle was correctly inserted. In this instance, neither allergic nor toxic reactions were causative factors. A vasomotor spasm with perineural edema of the facial nerve within the stylomastoid foramen was the probable explanation for the occurrence of facial paralysis.

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Safety measures for anesthesia in the dental office

Trent Laviano. *J.Connecticut D.A.* 32:4-13 July 1958

The dentist—more so than any other kind of medical practitioner—is an anesthetist. The dentist is fortunate in that the anatomic region in which he works is limited to structures which lend themselves readily to local analgesia.

Every dental procedure requiring analgesia should be regarded as an operation by the dentist and his patient, in the same sense that a surgical procedure is considered an operation by the surgeon and his patient. In taking the patient's history, the dentist should consider allergies, cardiovascular status, neurological status, and any special metabolic disorders.

Heart disease in a patient may be indicated by cyanosis, clubbing of the fingers, dyspnea, chest pain on exertion, a totally irregular pulse or a slow pulse, or swollen ankles. If one of these cardiac signs is observed, the dentist should consult the patient's physician.

The epileptic dental patient should be premedicated adequately, and should receive his medication prior to coming to the dental office. The dental patient who states he is taking thyroid tablets is a hypothyroid; he is an excellent candidate for local analgesia. A patient who volunteers the information that he is taking iodine or thiouracil is a hyperthyroid. Other indications of hyperthyroidism include a swollen neck, exopthalmus, palms drenched with perspiration, a warm and silky skin, or a fast or an irregular pulse. The hyperthyroid requires more preoperative medication than the average patient. The hyperthyroid patient is easily fatigued, and prolonged stress or surgery is poorly tolerated. The dentist should do a minimal amount of work at each sitting.

Much thought should be given to handling the diabetic patient. Generally, all anesthetic agents affect such a patient adversely. A young patient in whom diabetes is controlled should present no problem to a dentist using local analgesia. Dental treatment for an uncontrolled diabetic patient, however, is best deferred until the disease has been controlled by the physician.

The healthy, young adult dental patient of average size should receive 1½ grains of secobarbital sodium or pentobarbital sodium one and a half hours prior to the administration of the anesthetic. Patients over 60 years old should receive a third to a half this dose. The tranquilizing drugs probably have no place in premedicating the dental patient.

To obtain analgesia, the dentist should use the least amount of drug possible to accomplish the job. The dentist should always aspirate, and give the needle a complete turn before injection. Intravascular injections can result in convulsions, respiratory depressions and circulatory collapse. An injection should not be made in an infected region.

The dentist's first weapon of defense in any emergency situation in the office is oxygen. If the dentist suspects neurogenic or primary shock in the patient, he should tilt back the dental chair and administer oxygen. The one instance of syncope in which the chair should not be tilted back is the one in which the patient has suffered a cerebral vascular accident. If a hypertensive patient suddenly becomes paralyzed on one side of his body and his facial muscles screw up to one side as he faints, the chances are he has suffered a cerebral hemorrhage; to lower his head might worsen the hemorrhage.

The dentist who uses general anesthesia must adhere to the following precautions:

1. Anesthetize only the healthy patient.
2. Never anesthetize a pregnant woman.
3. The patient should never be anesthetized if he has a full stomach.
4. Adequate and proper premedication should be used.
5. The dentist should be prepared to overcome an obstructed airway, and to care for an apneal patient.
6. There always should be available oxygen and a means of administering it under pressure.
7. The dentist should be able to treat a person in shock and to care for a person in deep respiratory depression after an operation.
8. Suction apparatus should be available to prevent aspiration of vomitus or blood.

Danbury Hospital, Danbury, Conn.

Use of meperidine and meperidine-levallorphan mixtures in the recovery room

Max S. Sadove, M. J. Schiffrin, Warren R. Nickerson and William J. Grove. *J.A.M.A.* 166:1432-1437 March 22, 1958

The effect of narcotic analgesics on 160 patients with pain during the immediate postoperative period in the recovery room was studied. The "double-blind" technic was used. Meperidine hydrochloride in doses of 25 mg. and 50 mg. was administered. Also, to determine what effects the narcotic antagonist levallorphan hydrochloride would have on the pharmacologic responses to meperidine hydrochloride, three different ratios, by weight, of meperidine hydrochloride and levallorphan hydrochloride were studied and the results compared with results achieved when the placebo was used and when only meperidine hydrochloride was used.

Twenty-five milligrams of meperidine hydrochloride given intramuscularly provided about the same analgesic effect as did 50 mg. during the first hour after administration of the narcotic. The smaller dose is preferred because it causes less respiratory depression and sedation. Nevertheless, the slight depression of the respiratory minute volume produced by 25 mg. of meperidine hydrochloride was significant statistically. The simultaneous administration of meperidine hydrochloride and levallorphan hydrochloride reduced the extent of the respiratory depression without interfering with analgesia. The ratios of meperidine hydrochloride to levallorphan hydrochloride which are preferred are 100:1 and 80:1. The 60:1 ratio appeared to be the least desirable because it produced excessive sedation.

The report provides objective data in support of the use of small doses of narcotics during the immediate postoperative period.

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Friendship between dentist and patient

Werner Rudolf. *Med.Klin.* 53:768-769
April 25, 1958

Every dental general practitioner and oral surgeon knows that the fear of dental or surgical interventions is a factor which—even in emotionally normal and considerate patients—causes effects which influence all physiological functions of the organism. This phobia exerts considerable influence on the result of treatment and the deepness, duration and feasibility of anesthesia.

It is advisable, even necessary, that the person "on the other end of the scalpel or forcep" becomes better acquainted with the dentist or surgeon he fears.

Prior to dental or surgical intervention, there should be a discussion, a chairside or bedside chat, which not necessarily includes disease or treatment but generalities such as family, common friends, occupational experiences, plans for vacation and hobbies. A patient who collects stamps has more confidence in the man in the white gown who has the same hobby. In such a chat, the dentist will not find it difficult to establish common interests and thereby to span a bridge between him and his patient.

Friendship between dentist or surgeon and patient is far more effective than premedication with tranquilizing drugs.

Pettenkoferstrasse 18, Munich 15, Germany

Study of narcotics and sedatives for use in preanesthetic medication

James E. Eckenhoff. *J.A.M.A.* 167:415-422
May 24, 1958

The use of narcotics and sedatives for preanesthetic medication has been the subject of considerable discussion. The proponents of large doses of these drugs argue vehemently with the advocates of minimal use of depressants. Multiple agents are recommended by some authors, whereas single sedatives are preferred by others. There have been, however, few factual analyses of advantages and disadvantages of the use of narcotics and sedatives in preanesthetic medication.

The present blind study was undertaken in order to compare the effectiveness of commonly used narcotics (morphine, meperidine hydrochloride, alphaprodine hydrochloride) with that of secobarbital sodium and a placebo administered for preanesthetic sedation, and to determine the incidence of side reaction to each of these drugs and to observe the effect of each drug on the conduct of anesthesia and the recovery from it.

Solutions of the drugs to be tested were dispensed in identical bottles. These were coded and labeled by one individual. An attempt was made to prepare equipotent doses of the drugs. Each milliliter of solution contained morphine, 5 mg.; meperidine hydrochloride (Demerol Hydrochloride), 50 mg.; alphaprodine hydrochloride (Nisentil Hydrochloride), 30 mg.; secobarbital sodium (Seconal Sodium), 75 mg., or a saline solution (placebo). Neither the person writing for or administering the test medicament (called "blind medication X-ml."), nor the anesthesist, nor the person compiling the data was aware of the contents of any bottle until tabulation was completed. All drugs were injected intramuscularly in combination with atropine sulfate.

Blind medication was used in 1,761 patients. The study, however, deals with data recorded from 1,400 patients. The others were excluded for various reasons.

The following conclusions were reached:

1. Secobarbital administration led to a higher proportion of calm, carefree, yet alert patients than did the use of the other drugs.

2. Morphine, meperidine and alphaprodine produced more drowsy or sleepy patients and also a higher incidence of apprehension than did secobarbital.

3. More undesirable side effects occurred after preanesthetic medication with morphine, meperidine and alphaprodine than with secobarbital.

4. There was little difference in the influence of the four preanesthetic drugs on satisfactory induction of anesthesia.

5. Comparison of the recovery phase of patients receiving the various preanesthetic drugs was difficult because of the number of variables. No apparent difference was seen in the incidence of immediate postoperative vomiting or hypotension. Obvious differences, however, were observed in the rapidity of recovery, in the inci-

dence of postoperative restlessness and in complaints of pain. Fewer patients complained of postoperative pain when they had received narcotics (14 per cent) than did those given barbiturate (19 per cent) or saline solution (20 per cent).

6. Preanesthetic drugs did not influence the maintenance of anesthesia, except that respiratory depression occurred more often. When narcotics had been given, the patients remained narcotized longer after anesthesia than did those who had received secobarbital or the saline solution.

7. Continued routine use of narcotics for preanesthetic medication is an unwise and unwarranted procedure.

The data suggest that it is not necessary to abandon completely the preanesthetic use of narcotics but these drugs should be given only with a specific objective in mind and with an awareness of the hazards inherent in their use.

3400 Spruce Street, Philadelphia 4, Pa.

The Western Reserve anesthesia machine, oxygen inhalator, and resuscitator

Robert A. Hingson. *J.A.M.A.* 167:1077-1082 June 28, 1958

A midget portable anesthesia machine, oxygen inhalator and resuscitator has been developed at Western Reserve University. To date, more than 10,000 patients have been anesthetized with this machine, without major complications. A variety of pediatric, obstetric, dental and surgical operations have been performed with the aid of this machine. It has been used in 526 instances of dental surgery for the multiple extraction of from 2 to 20 teeth per patient. In dental patients, anesthesia developed to plane 2 surgical stage after 8 to 50 breaths, which correlated with blood stream levels of from 9 to 16 mg. of cyclopropane for each 100 cc. of arterial blood.

An anesthetic mixture of 30 per cent oxygen, 30 per cent helium and 40 per cent cyclopropane is used. The compressed mixtures of cyclopropane and helium, and of oxygen and helium, are packaged in thumb-sized cylinders. Combination of the contents of one cylinder of each type in the machine gives an anesthetic mixture that is nonexplosive. The cylinders are painted different colors for easy recognition. A green cylinder containing the compressed equivalent of 3,400 cc. of oxygen at atmospheric pressure is available for resuscitation and inhalation.

A compact, two-pound unit for use as an inhalator has been designed. It provides readily accessible oxygen for resuscitation, and is easy to operate. The oxygen is packaged under pressure of 4,000 psi in 10-cc. metallic containers about the size of a thumb. Each provides sufficient oxygen for an adult at rest for ten minutes per cylinder. The mask is pressed firmly on the face, with special attention to leakproof fitting around the bridge of the nose.

The most essential element for saving life is oxygen. Its prompt and proper administration by general practitioners, dentists, pediatricians or others is most effective in maintaining life. The death toll and brain damage due to lack of oxygen is twice that due to automobile accidents. The Western Reserve University device is readily available, easily portable so that the patient does not have to be moved before assistance is given, and is safe in operation and simple to operate. The machine can provide oxygen conveniently, both as inhalator and as resuscitator, under many conditions.

The machine has been tested thoroughly for a period of three years. It has been used successfully in two instances in which it was the sole source of oxygen in the treatment of patients with diagnosed cardiac standstill, and in an additional 28 reported instances of serious respiratory arrest during anesthesia or as a result of traffic accidents.

2065 Adelbert Road, Cleveland, Ohio

On the question of the functional response of paired salivary glands when a portion of the oral mucosa is anesthetized

A. P. Savinskaya. *Bul.Exper.Biol.& Med.* 43:287-290 March 1957

Pavlov has established that the functional state of the corresponding nerve centers largely determines the intensity of salivary gland activity. From this it follows that the mechanism of the differences in the functional state of the corresponding centers in the right and left cerebral hemispheres must be examined to establish the causes leading to a difference in the type and amount of secretion. An experiment was set up with the aim of observing one-sided partial anesthesia of the oral mucosa and the effects produced by it on the salivary secretion of paired parotid glands.

The experiments were conducted on dogs of three types: (1) strong, well-balanced; (2) strong, unstable, and (3) feeble. In dogs of the strong, stable type, ten minutes after a topical anesthestic had been applied to one side of the oral mucosa, there was a gradual weakening of the conditioned reflex response on the anesthetized side until zero level was reached; after 30 minutes, as the effect of the anesthetic would disappear, there was a complete restoration of the conditioned reflex response. The conditioned salivary secretion from the opposite side was not altered materially.

In dogs of the strong, unstable type, the conditioned reflex salivary secretion also diminished on the anesthetized side, beginning within five minutes of the application of the anesthetic to the mucosa. Secretion on the anesthetized side remained at low levels throughout the duration of the experiment (30 minutes).

In dogs of the feeble type, the salivary secretion of the conditioned reflexes was lowered from both glands, indeed being greater on the side opposite the anesthetized side. This was especially striking at the greatest depth of anesthesia (15 minutes after application).

The experiments were repeated, using a stronger anesthetic. It was concluded that exclusion of some of the afferent receptors by means of anesthesia of a portion of the oral mucosa produces changes in conditioned reflex salivary secretion: the stronger the anesthesia, the greater the changes in observable salivary secretion. The characteristics of the nervous system possessed by the individual animals seem to have great significance in the changes which are produced.

Consultants Bureau, Inc., 227 West 17 Street, New York

Development of symmetrical types of attrition in the animal and human dentition

Erich Körber. *Deut.zahnärztl.Zschr.* 12:840-844 June 15, 1958

Symmetrical types of attrition occurring in various species of vertebrate animals, including man, were studied at the Dental School and the Zoological Institute of the University of Tübingen, Germany.

The study was an attempt to find answers to the following questions which are of interest in prosthetic dentistry: (1) is it possible to differentiate between the types of attrition found in the dentition of animals? (2) is it probable that a relation exists between the types of attrition found in animals and those occurring in man? (3) is it possible to reproduce accurately in cast models the different types of attrition observed in human and animal teeth?

The attrition occurring in the teeth of the following animal species was investigated: (1) *Carnivora* (cats, dogs and martens); (2) *Rodentia* (guinea pigs, hares and squirrels); (3) *Ungulata* (horses, deer, goats and sheep), and (4) *Carcopithecidae* (Old World monkeys) and *Anthropoidea* (gorillas and orangutans).

The different types of attrition observed in animals and humans were classified according to Gysi's nomenclature.

A comparison of attrition forms found in animals with those observed in man established that similar types of attrition occur even when the topographic anatomy of the temporomandibular joint is dissimilar. Identical patterns of attrition were found in *Ungulata* (horses) and in *Rodentia* (hares and rabbits), although these species have temporomandibular joints which are different in form and size. The condyles in horses resemble those in man, whereas the condyles in hares and rabbits consist of sagitally positioned movable points.

A definite relation exists between the projection of the teeth and the development of a specific type of attrition. In all instances in which a generalized symmetrical pattern of attrition was found, the upper jaw was larger than the lower jaw. In all instances in which the gyroscopic pattern of attrition was found, the lower jaw appeared smaller in the premolar region but larger in the molar region than the same region in the upper jaw. Several combinations of jaw architecture were established and the corresponding types of attrition determined.

Excellent examples of the development of pattern of attrition which simulated occlusion were found in teeth in which the root development was incomplete, especially in hares and squirrels. The dental row erupted almost vertically in the jaws, and a characteristic occlusal surface developed symmetrically, influenced by attritive factors, in accordance with the specific formation of the jaws.

The observation of the development of specific types of attrition, especially symmetrical patterns in animals, leads to the supposition that in man similar patterns of attrition must occur. In order to test this theory, casts of various dentitions were made by dental students. The models, placed in Schröder's articulators, were tested with a horizontal plane of occlusion, and showed predominantly a distinct gyroscopic pattern of attrition. It was established that in instances of an extremely flat articulation of the temporomandibular joint, the region of the posterior teeth showed a more intensive attrition.

The natural pattern of attrition in animals seems to be influenced by the form of the angles of the jaws. Although this conclusion is in contrast to the thesis that attrition can be determined by the shape and function of the temporomandibular joint, the fact should carry some theoretical weight in the teaching of human articulation and attrition in connection with designing and constructing complete dentures.

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Studies on neurophysiologic mechanisms of salivary secretion. II. Physiological determination of localization of bulbar salivary center of dog

Y. Kawamura and M. Funakoshi.
M.J.Osaka Univ. 8:433-444 Feb. 1958
[in English]

Researchers agree on the main anatomic and physiologic features of the bulbar salivary center, but not on some details. This experiment was undertaken to study, in decerebrate and decerebellate dogs, the distribution of the salivary center in the medulla. Two methods were used. The first method was to stimulate the bulbar region electrically, point by point. The second method was to trace the bulbar points which responded to the antidromic stimulation of the secretory nerve.

The optimal electrical stimulation on the medulla to induce salivary secretion was 30 to 40 cycles per second, 1 to 4 volts of square wave, with a pulse duration of 1 millisecond.

The points in the medulla which induced the salivary secretion by this optimal stimulation were distributed from the level of the middle parts of the superior olivary nucleus to the rostral parts of the inferior olivary nucleus, and from the lateral parts of the spinal trigeminal tracts to the near parts of the median line. The points were at a depth of from 1 to 2 mm. from the dorsal surface of the medulla to the position of the nucleus facialis.

In the present experiment on dogs, the distribution of the bulbar salivary points was almost the same as reported in monkeys by Magoun and in cats by Wang.

The submandibular branch of the chorda tympani was stimulated at the point immediately before it entered the submandibular gland, and the distribution of the points in the medulla responding to this antidromic stimulation was observed.

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Operative dentistry

Clinical and experimental experience with the Borden Airotor

B. Nygaard Østby.
Norske Tannlaegeforen.Tid. 68:124-126
March 1958

The author has employed the Borden Airotor in his practice for three months. The machine will revolutionize the technic relating to revolving instrumentation. With the Airotor, tooth substance is brushed away without pressure or the use of any force. Cavities can be prepared and metal restorations can be removed in a fraction of the time spent when the conventional machine is used. In endodontics the pulp chamber is reached easily with the Airotor.

The handpiece of the Borden Airotor is simple to maintain; the inner parts require no cleansing or oiling. There are several flaws in the Airotor, however. The arrangement of the tube which conveys air and water from the control box to the handpiece is inconvenient and unhygienic. The tube should be coiled around a drum with a spring so balanced that the tube stretches directly from the box to the handpiece without any drag on the latter. The instrument provided for removing the bur from the handpiece is also a screwdriver, and has a sharp ridge which hurts the hand when the bur is pushed out of the chuck; these two instruments should not be combined. The assortment of burs and diamond points manufactured for use in the Airotor is inadequate.

Experiments were carried out on the reaction of the pulp to the high-speed instrumentation provided by the Airotor. With the Airotor, Class I and Class V cavities were prepared in the bicuspids of children 10 to 14 years old, and filled with amalgam. For controls, the contralateral tooth or a similar tooth in the other jaw was simultaneously treated in the same way, employing Ritter's electric engine without water spray. After more than 30 days the teeth were extracted, sectioned and studied histologically. Cavity preparation with the Borden Airotor at its top speed of 250,000 rpm and with maximum water spray had no deleterious effect on the pulp. The reactions in the pulp tissue—reduction of the odontoblastic layer and a scattering of lymphocytes—were less pronounced than those which followed use of the conventional engine without water spray.

The Borden Airotor has proved indispensable in practice, even though much work remains to be done to perfect its construction.

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Reaction of the human dental pulp to cavity preparation. I. Effect of water spray at 20,000 rpm

Herbert Swerdlow and Harold R. Stanley, Jr.
J.A.D.A. 56:317-328 March 1958

Little or no study has been made of the biological response of pulpal tissue to high-speed instrumentation. This study was designed to evaluate the effect of a coolant on the pulpal response of 60 sound human teeth in which cervical (Class V) preparations were made with an inverted cone no. 37 diamond stone rotating at 20,000 rpm. Thirty-three teeth were cut with a continuous air-water spray and 27 preparations were made without spray. The teeth were filled with zinc oxide and eugenol, extracted at intervals of time ranging from one hour to 36 days after cavity preparation, sectioned and studied histologically.

Definite injury to the pulp was observed in all teeth extracted after 24 hours. The inflammatory lesions in the teeth in which cavities had been prepared with spray were limited to the regions underlying cut dentinal tubules. Extensive damage or abscess formation was present only in the "nonspray" specimens.

Evidence of resolution or repair indicated that the potential for recovery was enhanced in the "with-spray" teeth.

When the floor of the cavity was close to the pulp, less subsequent reaction or damage occurred in the "with-spray" specimens.

The phenomenon of displaced cells in the den-

tinal tubules apparently is caused by an increase of the intrapulpal pressure which forces these cells into the tubules.

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A clinico-pathological study on the effect on the pulp of direct acrylic resin filling materials

Masuru Morimoto. *Shikwa Gakuho* 58:3:1-7 March 1958

A clinicopathologic study was made of the effect of five kinds of acrylic filling materials on the pulps of 100 human teeth. The materials studied were Kadon, Replica and Texton (produced in the United States), and Direct Ena Resin and Bioden (produced in Japan).

Sixty-five of the filled teeth (65 per cent) were symptomless; 35 (35 per cent) resulted in discomfort to the patient. Symptoms included spontaneous pain, thermal hypersensitivity of the dentin to heat or cold, and hypersensitivity to palpation or percussion.

Of the 100 filled teeth, 20 were classified as "good," 41 as "nearly good" and 39 as "no good," from the viewpoint of pathologic change. Pathologic changes in the pulp included the following: suppuration, round cell infiltration, necrosis, bleeding, congestion, atrophy and disappearance of odontoblasts, destruction of predentin, wandering of leukocytes into dentinal tubules, and the formation of new secondary dentin on the dentinal wall under the floor of the cavity. It is clear that filling materials have an injurious effect on the pulp tissue.

There was no definite relation between the clinical results and the thickness of the dentin under the floor of the cavity. It was presumed, however, that the thinner the layer of dentin at the bottom of the cavity, the more serious were the pathologic changes. When the layer of dentin was more than 2 mm. thick, pathologic changes in the pulp were not found.

Before acrylic filling materials are used, the pulp tissue should be protected from injury from such filling materials.

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An analysis of stresses in a dental amalgam restoration

David B. Mahler. *J.D.Res.* 37:516-526 June 1958

Although there has been general agreement concerning the over-all design of proximoocclusal amalgam restorations for deciduous molars, opinions differ concerning aspects of this design, particularly as to resistance form. An investigation was undertaken to evaluate this restorative design. A distoocclusal restoration in a deciduous mandibular first molar with incipient decay was chosen. The main retentive features of this restoration consist of an undercut occlusal dovetail, a proximal box wider at the gingival than at the occlusal surface, and a proximal retention groove. The significant stresses, determined by the method of photoelasticity, were analyzed in both the tooth and the restoration, and the following conclusions were drawn:

1. The failure of this restoration at the isthmus is due to the presence of tensile stresses in this region.

2. The tensile stress reaches a maximum at the occlusal surface of the restoration, thus designating this region as one from which fracture easily may be propagated.

3. Any surface discontinuities in this critical region—such as carved developmental grooves, roughened surface texture or inadvertent scratches or nicks—will produce deleterious stress concentrations.

4. The tensile stress at the occlusal surface increases in magnitude as the distance from the axial wall increases. The isthmus, therefore, should be placed as close to the axial wall as possible.

5. Of the four designs tested, the tensile stress in the restoration was least for the sloping axial wall design in combination with the flat pulpal wall design.

6. As to tooth structure, increasing the width of the isthmus and increasing the depth, both result in an increase in the internal stress within the tooth, thereby lowering its resistance to structural deformation and failure.

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Endodontics

Root resection for the general practitioner

B. C. Rogers. *New Zealand D.J.* 54:16-18 Jan. 1958

Root resection is desirable when a successful root filling cannot be completed in two or three appointments. It is best to combine root resection with root filling. Root resection should not result in the loss of too much radicular dentin, in too great a loss of root length, in discoloration of root and crown, and should not cause trauma of the soft tissues and postoperative pain.

Good lighting is essential, as are an adequate roentgenogram and a saliva ejector. All other requirements are met by a small sterile kit containing the following: two no. 6 or no. 7 round burs; two no. 3 fissure burs; a Bard-Parker scalpel; a periosteal elevator; a selection of reamers (a no. 3 or no. 4 is essential, and a no. 6 or no. 7 reamer is used for the final preparation of the canal); a small curet; a ball burnisher; a pair of small scissors; swabs and large cotton wool pellets; coarse paper points; phenol and alcohol for sterilizing the canal; large gutta-percha points and chloroform, and cotton sutures.

The tooth is anesthetized and the flap is raised. The incision should not be deeply curved but should follow and lie just below the attachment of the labial mucosa to the fixed gingiva, and should extend well over the adjacent teeth. A sharp blade is used to cut down to the cortical bone. The periosteum is pushed up as high as it will go with an elevator without undue force. A swab is held firmly in the wound until the initial bleeding stops.

The bone over the apex of the tooth is removed with a no. 7 round bur until the root is exposed. Where there is a long-standing granuloma, the cortical plate can be lifted away. The bur is pressed into the root at the point where it is to be resected, until the canal is entered. A thin reamer is passed up the canal. The canal is cleaned with reamers ranging in size up to no. 6 or no. 7. The hole is plugged tightly with a cotton wool pellet, and the canal is sterilized with phenol and alcohol, and dried with coarse paper points. Only one or two changes of the cotton pellet will be necessary to obtain a clean, dry canal, which then is packed with gutta-percha dipped in chloroform. The cotton pellet is removed and the excess gutta-percha is smoothed off with a ball burnisher. The root is cut completely through with a fissure bur and the tip and the granuloma are removed with a curet. The cavity is syringed, allowed to fill with blood, and the wound is closed with two sutures.

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Treatment of vital exposed permanent pulps by partial pulpectomy

Antony H. Melcher. *J.D.A. South Africa* 13:147-151 April 1958

Fifty-one exposed vital pulps in the permanent teeth of patients ranging in age from 11 to 58 years were treated by pulpotomy. After hemostasis had been established, one of the following procedures was carried out:

1. The radicular pulp was immediately covered with a paste of calcium hydroxide and sterile water. Twenty-three teeth were treated in this manner.

2. The radicular pulp was immediately covered with Calxyl, a proprietary preparation consisting of calcium hydroxide in combination with minute quantities of other salts. Eighteen teeth were treated in this manner.

3. The radicular pulp was sedated with beechwood creosote for from 24 to 72 hours before being covered with Calxyl. Ten teeth were treated in this manner.

In all instances the layer of capping material was about 3 to 4 mm. thick. This was immediately covered with a thin mix of zinc oxyphosphate cement, and a permanent restoration was inserted. The periods of observation varied from

five to seven years. Two of the teeth treated were central incisors, two were lateral incisors, 12 were bicuspids and 35 were molars.

The treatment was considered successful if roentgenographic examination showed the formation of a dentinal bridge, if there were no changes in the apical region and no evidence of internal resorption, and if the patient reported no pain or discomfort.

Of the 23 teeth treated with calcium hydroxide, the results were successful in 17 (74 per cent). Of the 18 teeth treated with Calxyl, success was obtained in 14 (78 per cent). Of the 10 teeth treated with sedation and Calxyl, success was obtained in 6 (60 per cent). There is little to choose between Calxyl and calcium hydroxide as a capping material for use after partial pulpectomy, provided the material is applied to the remaining pulp immediately after amputation and not after a period of sedation with beechwood creosote. Calxyl can be obtained in radiopaque form, and this is an advantage when used after pulpotomy, as a radiolucent material tends to give the appearance of recurrent caries.

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Transverse intra-alveolar root fractures: roentgen diagnosis and prognosis

Bengt Lindahl. *Odont.Revy* 9:10-24 Jan. 1958 [in English]

The prognosis of intra-alveolar root fractures is widely believed to be poor, and therapy often consists of removal of the tooth. An investigation was undertaken to determine whether the prognosis of an intra-alveolar root fracture is so poor as to justify routine extraction.

The material consisted of 25 teeth with transverse root fractures in 20 patients between 10 and 59 years old. Of the 25 fractures, 20 were in upper central incisors, two in upper lateral incisors, two in upper bicuspids and one in a lower bicuspid. Twelve of the patients were between 10 and 20 years old at the time of injury and seven were between 20 and 59; in one the injury could not be dated.

Seven of the 25 teeth functioned well for more than ten years, two for 23 years and one for 26 years. Transverse root fractures do not appear to shorten the functional life of a tooth. Healing was followed by the complete, or almost complete, disappearance of all symptoms. Many of the fractures healed spontaneously. Teeth healed even when root fillings had been carried out. The course of healing could be followed by a close roentgenographic follow-up. Obliteration of the pulp cavity, formation of new hard tissue in the fracture space and rounding off of the juxtaposed corners of the fragments could be seen.

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A preliminary investigation into the electrical properties of human teeth

T. H. Farrell. *Brit.D.J.* 104:353-359 May 20, 1958

An experimental pulp tester has been designed which yields an accuracy of $\pm$ 10 per cent. The apparatus employs standard circuits to produce square or rectangular pulses of varying duration and repetition frequency.

The use of alcoholic "Dag," a colloidal suspension of graphite in isopropyl alcohol, on the dried tooth surface as a means of reducing contact resistance, is effective, and can be used with other pulp testers, providing they have an output control commencing at zero. Since the effective resistance varies with the area of the patch, this area must be considered; for vitality tests, this area should be as large as possible, without touching the gingival margin or making contact with a metal filling. For comparative tests the patches should be about the same size.

Strength-duration curves can be plotted on teeth and chronaxie determined. The changes in the shape of the curve with the pathologic condition of the pulp have yet to be investigated.

Frequency threshold curves plotted on teeth show that the threshold increases with frequency. The fact of this relationship has been taken into account in the experimental pulp tester.

Repeated tests on a tooth at any one sitting cause an increase in the threshold and should be avoided where possible.

An electrode ending in a simple brass ball was found to be satisfactory when used in conjunction

with alcoholic Dag. Flattened electrodes tend to scratch the graphite surface, and are more difficult to hold still with constant pressure.

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Duration of antibacterial effectiveness of four antiseptics used in root canal treatment

B. Engström. *Svensk tandläk.Tskr.* 51:1-6 Jan. 15, 1958

The duration of antibacterial effectiveness of four endodontic antiseptics was investigated at the Dental School of Stockholm, Sweden.

Clinical experience has shown that these four antiseptic solutions tested—(1) iodine solution (5 per cent iodine, 10 per cent potassium iodide and 85 per cent distilled water); (2) chloramine-T (sodium 4-toluenesulfonchloramide, 10 per cent in an aqueous solution); (3) Chlumsky's solution (30 per cent phenol, 60 per cent camphor and 10 per cent alcohol), and (4) tricresol-Formalin (1:1)—used frequently for topical application in endodontic treatment, have a low toxicity. No serious side effects have been observed.

Fifty-four teeth were used, in which root canal treatment was started but not completed and in which the last bacterial tests were negative. All those teeth had radiolucent areas.

The apical foramen was enlarged with a Hedström file no. 1. All paper points, which had served as dressings, were transferred to blood agar plates which were inoculated with *Staphylococcus pyogenes* var. *aureus*. It was thereby possible to demonstrate and evaluate the duration of the antibacterial effectiveness of each endodontic antiseptic investigated.

The classification used was as follows: (1) demonstrable effectiveness after more than 72 hours, "excellent"; (2) after more than 48 hours, "good," and (3) after 24 hours or less, "fair."

The results obtained indicated that both the iodine solution and chloramine-T have a comparatively short duration of antibacterial effectiveness (after 24 hours there were hardly any zones of inhibition demonstrable). Both endodontic antiseptics, therefore, were classified as "fair."

Chlumsky's solution was slightly effective after more than 48 hours, and was classified as "good."

Tricresol-Formalin had the longest duration of antibacterial effectiveness, and zones of inhibition were demonstrable even after one week. This endodontic antispetic, therefore, could be classified as "excellent."

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Relation between clinical and histopathological findings in healing process after infected root canal treatment

Masao Komiyama. *Shikwa Gakuho* 58:3:8-16 March 1958

Root canal treatment was carried out on 55 teeth in which either pulp gangrene or chronic alveolar abscess was diagnosed. Each canal was sterilized on alternate days for from two to eight times and then filled. From 8 to 397 days after filling, the apex and its surrounding tissue were removed by apicotomy.

The disinfectants used were phenol camphor, formocresol and eugenol. The filling materials used were calcium hydroxide paste, paraformaldehyde and zinc oxide-eugenol.

The findings were as follows:

1. Reduction of redness and of swelling in the gingiva near the apex of the infected tooth, before completion of the root canal treatment, does not always mean that healing has progressed in the periapical tissues.

2. The existence, the increase or the reduction of pain is not related closely to the state of healing in the periapical tissues.

3. A reduction in the looseness of the infected tooth indicates healing of the periapical tissues.

4. A reduction of the gangrenous smell from the root canal under treatment is related closely to progress in healing of the periapical tissues.

5. A reduction in the exudate from the root canal indicates the chances are good that the periapical tissues will heal.

6. Objective symptoms are more reliable than subjective symptoms in estimating the healing after the root canal treatment of infected teeth.

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Pedodontics

Thumb- and finger-sucking: a study of 2,650 infants and children

Alfred S. Traisman and Howard S. Traisman. *J. Pediat.* 52:566-572 May 1958

In a study of thumbsucking, 2,650 infants and children were selected in consecutive order from a general pediatric practice. All patients were Caucasian, came from the middle socioeconomic group, and had no chronic or congenital diseases that could alter their feeding habits. Many of the patients were followed until they were 17 years old. In this paper thumbsucking is used to refer to placing the thumb or fingers deep into the mouth many times every day and night and exerting sucking pressure.

Of the 2,650 patients, (1,340 male and 1,310, female), 1,208 (45.6 per cent) were thumbsuckers (596 male and 612 female). The sex distribution was not significant statistically. Seventy-five per cent of the infants who sucked their thumbs began to do so during the first three months of life, and the other 25 per cent during the remainder of the first year.

Three hundred infants (11.3 per cent) were partially or completely breast-fed. Average duration of this type of feeding was 4.4 months. Of the 300 breast-fed infants, 130 (43.3 per cent) sucked their thumbs. Breast feeding was not a significant factor in the incidence of thumbsucking.

Feeding time probably was significant. The majority of the 2,650 patients (81.6 per cent) took 30 minutes or less to feed. Of patients in the group of "fast" and "average" feeders, 41.7 to 45.8 per cent sucked their thumbs. Of those in the "slow" group of feeders, 62.7 per cent sucked their thumbs. The smallest percentage of those who sucked their thumbs was in the "very slow" group that took 60 minutes or longer to feed.

The average age at which all thumbsucking stopped was 3.8 years. A few stopped during infancy, and some as late as 12 to 15 years.

Of 28 patients who used pacifiers, eight sucked their thumbs.

Malocclusion occurred in 211 patients, or 7.9 per cent of the total group. Of these children, 117 (55.4 per cent) sucked their thumbs. Of 86 children who wore braces for malocclusion, 53 had never engaged in the sucking habit and 33 sucked their thumbs. Of thumbsuckers, 9.7 per cent developed malocclusion; of nonthumbsuckers, 6.5 per cent developed malocclusion. The degree of relationship between thumbsucking and malocclusion, though statistically significant, is small and of limited extent.

Psychological problems occurred in 137 patients (5.2 per cent). Of these 137 patients, 67 (49 per cent) sucked their thumbs. There was no statistically significant relation between psychological problems and thumbsucking. There was no relation between colic and thumbsucking. There was no significant difference in the thumbsucking habit between only children and those with from one to four siblings.

The problem of thumbsucking has been overemphasized and parents unduly alarmed.

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Prevalence of enamel hypoplasia among children who previously had suffered from gastrointestinal disease

Gertrud Lindemann. *Odont.Tskr.* 66:101-126 April 1958

The teeth of 141 children 11 to 13 years old who, during the age period from birth to two years, had suffered from gastrointestinal diseases, were examined for enamel hypoplasia. A control group consisted of 124 children; the parents of these children were not aware of any diseases suffered by the children in infancy and the children had been attended in their first year by public health nurses.

Thirty-two of the 141 children (22.7 per cent) in the experimental group showed chronologic enamel hypoplasia of general origin. A coincidence between the assumed period of development of the enamel hypoplasia and the known

period of gastrointestinal disease could be found in 81.2 per cent of the 32 children; in 18.8 per cent, no coincidence was found.

Nineteen (15.3 per cent) of the 124 children in the control group showed chronologic enamel hypoplasia.

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Effect of premature loss of deciduous teeth on permanent dentition: a biometric evaluation

Sten Linder-Aronson. *Svensk tandläk.Tskr.* 51:255-271 May 15, 1958

Forty-one school children were the subjects of a biometric study of the effect of premature loss of deciduous teeth on the permanent dentition. The investigation was undertaken at the Center for Public Dental Care in Frösön, Sweden.

The biometric measurements were taken on plaster cast models made from both jaws of all children examined. The amount of space loss in the dental arches, the position or malposition of adjacent and succedaneous teeth and the degree of alteration of contact points caused by caries, produced by the premature loss of deciduous teeth, were recorded and evaluated.

In the 41 children examined, 141 deciduous teeth were lost either by extractions or accidents. In 40, the premature loss was unilateral (in 34 in the upper jaw and in 6 in the lower jaw). Bilateral tooth loss was observed in one child only. In seven children, tooth extractions had been performed before the patients had reached school age which in Sweden is seven years.

The dimensions of each tooth and of the dental arches measured, and the sagittal relations between the right first molar and the left first molar as well as the mobility of all teeth, were determined.

The measurements were taken with the help of sliding calipers and protractors. A specially constructed apparatus was used with which minute differences in height, length and width as well as the qualities of extension and size could be recorded.

The over-all results were broken down into groups representing the condition of each adjacent or succedaneous tooth according to the period elapsing after the premature loss occurred.

A specific marginal amount of space in the dental arches may be lost safely through forward movements of the first permanent molars in advance of their normal time of eruption. In most instances, however, this space cannot be lost without producing crowding in the permanent dentition. In general, less space was lost by extraction of the first deciduous molars than by extraction of the second deciduous molars. The highest rate of space loss was observed in the upper permanent molars (between the second and the third molars). The number of instances in which two adjacent deciduous teeth had been extracted was not sufficient to permit detailed evaluation of the effect on the succedaneous teeth.

It was frequently observed that the tongue, by filling the gaps, acted as a space retainer.

The mean value of the difference between the absolute width of the dental arch on the side of the premature loss and that of the dental arch on the other (control) side was 0.74 ± 0.30 mm. No demonstrable difference existed between the width of the dental arches of the upper and the lower jaws. No evidence was found to substantiate the theory that premature loss of deciduous teeth produces displacements on the midline (mean value: 0.06 ± 0.19 mm.) or that it results in mesiopalatinal rotation of the first upper molars (mean value: 0.67 ± 3.51 degrees).

In the majority of instances, the first permanent molar on the side where premature loss occurred had a more mesial position than the first molar on the other (control) side, the mean value being 1.01 ± 0.28 mm. This difference in position seems significant for orthodontic treatment, and with 99 per cent probability will be between 0.23 and 1.79 mm.

The rate of space losses in the dental arch was found to be almost identical in all children examined (between 14 and 15 years old), and, therefore, the space loss to be expected seems to be related not to the age of the patient but to the number of years elapsing after premature loss occurred and the number of years likely to elapse before the bicuspids erupt. There seems to be no intrinsic age factor involved.

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Biochemistry

The effects of feeding fluorine, as sodium fluoride, to dairy cattle—a six-year study

G. W. Newell and H. J. Schmidt.
Am.J.Vet.Research. 19:363-376 April 1957

An experiment in which dairy cattle were fed sodium fluoride was started in December 1949, to determine the effects of prolonged feeding of fluoride under conditions of practical dairy management. The cattle were divided into groups, the daily feeding of fluoride for each group ranging from 0.15-0.3 mg. per kilogram of body weight to 2.5 mg. After six years, the following observations were made:

1. The addition of fluorine, as sodium fluoride, at levels as high as 2.5 mg. per kilogram of body weight per day caused no significant difference in milk production between the animals receiving fluoride supplement and the control animals.

2. The inseminations per conception, the days in gestation and the percentage of live births were not influenced by the levels of fluoride consumed. Birth weights of calves all were within the normal ranges, regardless of fluoride treatment.

3. Fluorine, as sodium fluoride, fed at levels up to 2.5 mg. per kilogram per day did not influence the rate of growth.

4. Individual urinary fluoride values varied widely with the same level of fluoride intake, but group averages tended to show a relationship to the amount of fluoride ingested.

5. Fluoride deposition in bone and cartilage was found to be the most reliable indicator of the levels of fluoride ingested. Analyses of metacarpal bones of newborn calves demonstrated a slight placental transfer of fluoride from the cow to the calf. Soft tissues did not store appreciable amounts of fluoride.

6. The degree of dental fluorosis was dependent on the length of time of experiment, the amount of fluoride fed, and on the age of the cow when sodium fluoride first was administered. Permanent teeth already erupted when the experiment was begun were not significantly affected.

7. The general health of the herd remained on a high plane throughout the experiment. However, frequent appearances of unthriftiness and roughened coats were seen in cows fed 2.0 and 2.5 mg. of fluoride per kilogram of weight. Exostoses occurred on the metacarpal bones of two cows in the 2.5 mg. group; one of these animals subsequently exhibited occasional signs of pain and lameness in walking. Hoof elongation did not occur as a result of ingesting sodium fluoride.

8. Diarrhea which could be attributed to the feeding of sodium fluoride did not occur.

9. Bone lesions consisted of roughening of the periosteal surfaces of the compact bones and the presence of plaques of new bone in the adjacent periosteum of the metacarpal, metatarsal and rib bones. In the soft tissues, no histological changes which could be ascribed to the ingestion of sodium fluoride were found.

10. The ingestion of fluoride on a parts per million basis was 7.3, 33.6, 44.7, 60.4 and 85.6 in the feed and water, for cows fed 0.15 to 0.3, 1.0, 1.5, 2.0 and 2.5 mg. per kilogram of body weight, respectively.

11. The results of this six-year study suggest that 2.0 to 2.5 mg. of fluoride per kilogram of body weight is the level at which toxicosis may be expected to occur, after periods of prolonged ingestion.

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Physiologic chloride levels in human whole saliva

Ira L. Shannon and John R. Prigmore.
Proc.Soc.Exper.Biol.& Med. 97:825-828 April 1958

Chloride concentration of human saliva varies in certain systemic disease states. Dental research interest in salivary chlorides in relation to dental caries has stemmed primarily from the knowledge that chlorides enhance amylase activity and from

reports that amylase activity of saliva from caries-active subjects is significantly higher than from subjects free from carious lesions.

The present study was designed to determine physiologic chloride levels under two different forms of stimulation and to study the effects of age and sex on chloride concentration and salivary flow rate and the effect of volume on chloride levels.

Whole saliva samples were collected at 9 A.M. from 323 young men and 159 young women; to elicit salivary flow, each subject chewed vigorously on three large crepe rubber bands for five minutes. Whole saliva samples also were collected from 503 young men and 179 young women, with no exogenous stimulation being employed. The following conclusions were drawn:

1. No significant differences in volume attributable to age were noted. The rate of flow for men was significantly higher than that for women. The rate of flow for both men and women was significantly higher when exogenous stimulation was utilized.

2. No significant increase or decrease in chloride values attributable to age was noted.

3. For women, volume and chloride were negatively correlated, whereas for men a positive correlation was found with exogenous stimulation and a negative correlation when no such stimulation was used. For both men and women, chloride levels were significantly higher when exogenous stimulants were used.

Research Dentistry Division, School of Aviation Medicine, Randolph Air Force Base, Texas

Glycolytic and acid-forming properties of the saliva in caries-susceptible and caries-resistant patients

S. I. Gürkan and N. Mizan. *Tip.fac.mecmuasi* 20:28-38 Dec. 1957

The saliva and the salivary mucin of caries-susceptible and caries-resistant patients were investigated at the Dental School of the University of Istanbul, Turkey. The study was designed to establish whether the glycolytic and acid-forming properties of the saliva in these patients have a relationship to pathologic oral conditions, especially dental caries.

Many authors have hypothesized that the salivary mucin, a carbohydrate-protein complex, could be depolymerized in order to liberate a constant source of proteins and carbohydrates which might serve as lactic acid formers for the natural oral flora. The glycolytic effect in saliva and salivary mucin was determined by the modified Elson-Morgan method. Forty persons, taken at random, formed the study group. Salivary lactobacillus counts were taken periodically.

The glucosamine hydrochloride amount in 100 ml. of saliva varied between 12 and 72 mg., the mean value being 34 mg. The lactobacillus count varied between almost 0 and 184,000 per milliliter of saliva.

In caries-resistant patients the saliva showed hardly any glycolytic or acid-forming effects.

In caries-susceptible patients, however, both the glycolytic and the acid-forming effect were determinable, increasing or decreasing according to the degree of carious lesions present or pathologic changes developing in the alveolar process.

More research must be done, however, before it can be determined whether a relationship exists between the glycolytic and acid-forming activity in the human saliva and the development of caries.

Dental School of the University of Istanbul, Turkey

A salivary antibacterial factor related to dental caries immunity

Gordon E. Green. *Bact.Proc.* 87, 1958

Previously, a factor which inhibits growth of lactobacilli and streptococci has been found in the saliva of caries-immune human beings and not found in the saliva of caries-susceptible human beings. The factor has biologic activities in vitro which may account for the lower number of salivary lactobacilli found in the saliva of caries-immune persons. The factor is associated with the globulin fraction of saliva, and preparations of the active material were homogenous in ultracentrifugation studies.

Lactobacilli cells adsorbed the inhibitory factor on contact with the saliva from caries-immune persons, and were inhibited in the usual manner when removed from the saliva and placed in other

media. The factor could be eluted in active condition from adsorbing cells, and the eluted factor showed multiple specificities for other cultures.

Mixing of fractions of saliva from caries-immune and caries-susceptible persons indicated there is no antifactor substance in the saliva of caries-susceptible persons and that the inhibitory factor apparently is peculiar to saliva from caries-immune persons.

Surviving cells in a system where inhibition had occurred were not thereafter more resistant to inhibition by the salivary factor than were the cells in the original culture. Antiserums against the globulin fractions of saliva from caries-immune and caries-susceptible persons showed some cross-reactions in precipitin tests. Lactobacilli cells were used to adsorb saliva from both caries-immune and caries-susceptible persons, and these adsorbing cells were agglutinated by the homologous antisalivary globulin serums with a greater degree of specificity. This work indicates that an antibacterial factor which apparently is peculiar to the saliva of caries-immune persons is a chemical entity, probably globulin.

College of Dentistry, Ohio State University, Columbus, Ohio

Histochemical study of amelogenesis and dentinogenesis

W. da Silva Sasso and N. Marques de Castro. *An. Fac. farm. e odont. Univ. São Paulo.* 14:103-110, 1956

Research, based on the work of Wislocki and collaborators and of Todescan and Sasso, was undertaken to determine the presence and action of alkaline phosphatase on odontogenesis in white rats. The histochemical studies consisted in establishing whether alkaline phosphatase, mucopolysaccharides, keratin, and calcium were present. These substances were correlated with the mechanism of formation and calcification of the organic matrix during amelogenesis and dentinogenesis in one-day-old white rats. The reaction for alkaline phosphatase was positive in the pulp and enamel organ, intensely positive in the intermediate stratum and the region which corresponds to Weil's zone, and negative in the ameloblasts and odontoblasts. The reaction for sulfomucopolysaccharides of the CSA type was positive in ameloblasts and odontoblasts. Keratin was observed in the amelogenic organic matrix only. Deposits of calcium were observed at the amelodentinal junction.

The results of the study proved that the chemical substances present during the early stage of odontogenesis act upon (either directly or indirectly) the amelogenesis and dentinogenesis. The alkaline phosphatase is indispensable for the mechanism of calcification of enamel and dentin. It is formed at and supplied by Weil's zone and the intermediate stratum. The sulfomucopolysaccharides of the CSA type are formed at and supplied by ameloblasts and odontoblasts. These substances undergo transformation into the material which constitutes the organic matrix of the enamel and of the dentin.

Rua Três Rios 363, São Paulo, Brazil

Experimental studies on the effect of growth-accelerating substance on the growth of teeth, especially on mineralization. II.

Morimasa Murakami. *Shikwa Gakuho* 58:12-19 Jan. 1958

A biochemical, histologic and physiologic study was conducted on the effect of some growth-accelerating substances on the growth of teeth in animals. The three substances studied were Hypohorin (produced from pituitary gland), Thmenin (produced from placenta), and Myelon, a bone marrow constituent.

The first two substances increased the body weight of young animals, but their effect on the growth of teeth was obscure. It was confirmed that Myelon produced a remarkable increase in body weight and accelerated the growth of teeth, especially the mineralization of teeth.

Tokyo Medical College, Tokyo, Japan

Bacteriology

Disturbance of the bacterial balance of the oral flora caused by antibiotic treatment

Th. Hürny. *Schweiz.Mschr.Zahnhk.* 68:393-396 May 1958

The last decade has witnessed an unprecedented development in the treatment of oral infections and a significant change in the practice of dentistry. The variety of antibiotics and other antimicrobial agents recently discovered and made freely available during this comparatively short span of time has permitted the control of many bacterial infections.

These drugs, employed mainly for their systemic effect in combating infectious microorganisms, have not eliminated the role of bacteria, spirilleae, viruses, molds and yeast in the causation of oral disease, but they have introduced new problems in the therapeutic management of these diseases.

The microbial world has responded to the introduction of antimicrobial compounds into its ecologic balance in a variety of ways. Certain inflammatory processes involving the mucous membrane of the oral cavity are caused by disturbance of the bacterial balance of the oral flora due to reactions to the chemotherapeutic agents so frequently used. It seems apparent that the indiscriminate use of antibiotics, sulfonamides and other anti-infectives invalidates their undeniable benefits.

Secondary inflammatory processes of the mucous tissues of the oral cavity, due to a demonstrable imbalance in the oral flora, should be treated by prescribing an appropriate diet consisting of large amounts of fresh vegetables, salads, sauerkraut, radishes, fruits (no citrus fruits) and yoghurt (not in excess). Restoration of bacterial balance in the oral flora should be attempted by direct inoculation with the bacterial content of the saliva obtained from healthy persons.

Restoration of the balance in the gastrointestinal flora is more difficult because the gastrointestinal tract resists every attempt of flora therapy. Successful treatment of the bacterial imbalance in the oral flora, however, will gradually facilitate the normalization of the gastrointestinal flora.

In many infectious processes, chemotherapeutic agents inhibit bacterial multiplication and diminish thereby the manifestation of symptoms without eradication of the infective microorganisms. This results in the establishment of a masked chronic process which is difficult to diagnose.

Minimal use of antibiotics, employing them only when they are unequivocally indicated for the treatment or prevention of clinically and bacteriologically proved oral infection, is the step dentists must consider to minimize the dangers of disturbance of the bacterial balance of the oral flora and its complications.

Spitalgasse 4, Bern, Switzerland

The value of the twelve-hour disk sensitivity test to the management of infections of the face, neck and oral cavity

Tyler Cleveland Folsum, Jr. *Northwest.Univ.Bul.* 58:40-45 Spring 1958

This investigation was undertaken to evaluate the 12-hour disk sensitivity test (O'Toole, 1946; Spaulding and Anderson, 1951, and Lynch, 1955) as a means of determining the susceptibility of bacteria to antimicrobial agents. The value of the 12-hour disk sensitivity test is apparent to those who must treat the individual who has an infection. The importance of a rapid, accurate method of determining the susceptibility of microorganisms to antibiotic and chemotherapeutic agents was never so great as at present when so many resistant strains of *Micrococcus pyogenes* and even of streptococci are being encountered. Of almost equal value is the information concerning which agents are ineffective in these instances. The accuracy of this method of testing for susceptibility is well-established. The test

can be set up at the end of the working day in which the specimen is received, and can be read and reported early the following day.

Eighteen antibiotics were studied. Twelve-hour disk sensitivity tests were made on material obtained by extraoral or intraoral aspirations of lesions in 109 patients, most of whom had oral infections. Ninety-seven of the 109 specimens produced good growth. Forty patients were given treatment based on the results of the 12-hour disk sensitivity test; 27 of these (67.5 per cent) improved in six days or less; nine (23 per cent) improved in from seven to ten days, and four required more than 11 days for healing and recovery. Twenty-five (68 per cent) of 37 patients who received adequate surgery with no antibiotics showed improvement in one to six days; five (14 per cent) of the remaining patients in this group showed improvement in periods ranging up to 20 days, and the remaining seven improved in from seven to ten days.

The inability of the sulfa drugs, in this study, to produce uniform, consistent zones of inhibition is of interest and was not anticipated when this investigation was undertaken. The isolation, in 29 instances, of resistant strains of streptococci was not anticipated and gives added importance to the procedure of testing the etiologic agent of a specific infectious process. The observation that adequate surgery produced early recovery emphasizes the fact that antibiotics are not a substitute for early and adequate surgery.

An analysis of the data leads to the following conclusions:

1. Use of the 12-hour disk sensitivity test against several drugs, in terms of a specific infectious process, resulted in a significantly greater percentage of cures in a shorter period of time.

2. The most commonly encountered etiologic agents in infectious processes studied in this series were strains of *Micrococcus pyogenes* and streptococci.

3. The incidence of isolation of resistant strains of microorganisms is somewhat greater than previously reported, but follows the general trend observed in such studies.

4. The isolation, in 29 instances, of penicillin-resistant strains of streptococci, including beta hemolytic strains, is at variance with some reports.

5. The observation of rapid improvement in those patients who received adequate surgery without concurrent medication confirms an opinion not previously justified by scientific methods.

6. The 12-hour disk sensitivity test is easily performed with a minimal amount of equipment, and can be used in even the smallest laboratory.

U. S. Public Health Service Hospital, Stapleton, N. Y.

Therapeutics

Effects of growth hormone on the bone and periodontium of vitamin A-depleted rats

L. A. Bavetta, Ben Ershoff and S. Bernick.
J.South.California D.A. 26:247-250
July 1958

Young rats which had been depleted of vitamin A were divided into two groups. One group received ten daily intraperitoneal injections of 0.5 ml. saline solution. The second group received ten daily intraperitoneal injections of 0.5 ml. of growth hormone solution containing 100 micrograms of growth hormone.

After a ten day experimental period, it was noted that rats depleted of vitamin A failed to respond to injected growth hormone by an increment in body weight, but that such treatment stimulated bone growth. Growth hormone therapy caused a resumption of chondrogenesis in the epiphyseal region of the tibia, bone formation in alveolar bone and the formation of normal appearing incisal dentin.

Present findings suggest that the impaired chondrogenesis and osteogenesis of the tibia and alveolar bone of rats depleted of vitamin A were due at least in part not to a vitamin A deficiency in itself in these tissues but rather to an inadequate production or secretion of growth hormone which occurs as a consequence of vitamin A deficiency.

School of Dentistry, University of Southern California, Los Angeles, Calif.

Penicillin injections causing anaphylactic shock

K. Prantl and R. Wegmann.
Schweizer.med.Wschr. 88:288-290
March 22, 1958

Three instances of anaphylactic shock caused by allergic reactions to penicillin injections are reported. The patients obviously were highly penicillin-sensitive; severe anaphylactic shock occurred in dental offices after multiple tooth extractions followed by injection with 600,000 units of procaine penicillin.

In two of the instances, skin tests were made prior to the extraction to determine whether the patients were allergic to penicillin. The tests were negative; probably the allergic reactions were of the delayed type.

This seems to demonstrate that skin tests cannot be depended on to determine penicillin sensitivity.

To safeguard patients, antibiotics should be used only when indicated. If there is a history of previous hypersensitivity to penicillin, other antibiotics should be used. A penicillin preparation for oral use should be used whenever such use is feasible.

Special care should be taken if an allergic diathesis is suspected.

When penicillin is injected intramuscularly, radial nerve injury must be avoided. Patients should always be watched for at least 20 minutes after a penicillin injection. Small doses of epinephrine (1:1,000), from 0.03 cc. to 0.05 cc. should be given at the site of the injection. The patient must have an open airway and sufficient oxygen. Norepinephrine, a pressor substance, 4 mg. in 1,000 cc. of saline solution, should be injected intravenously but slowly.

In instances of anaphylactic shock caused by penicillin injections, dihydrocortisone given intravenously may be lifesaving.

Gerichtlich-medizinisches Institut, University of Zurich, Switzerland

Synthetically prepared compounds related to epinephrine having vasodilative properties

F. Brücke. *M. Mundi* 3:96-100
Oct.-Dec. 1957

The action or influence which substances of low molecular weight exert on smooth muscles varies greatly.

Histamine dilates the muscles of the peripheral vascular regions but it contracts the musculature of the pulmonary vessels.

Acetylcholine has a relaxing, but sometimes a spastic action on smooth muscle fibers depending on the point of action.

The multiple and heterogeneous effect that may be exerted by a drug is demonstrated by epinephrine. This drug, in comparatively low doses, dilates the vessels of the working muscles, thereby lowering the blood pressure. It may dilate the vessels of the brain and promote an automatic activity of the sinal node in the heart, thereby producing tachycardia. It may cause extrasystoles by promoting discharges from lower rhythmic centers. It increases the sugar and lactic acid levels in the blood.

It can be assumed that at least two different receptors for epinephrine exist to which these varying effects correspond, although the primary site of action of epinephrine is unknown.

Since the discovery of epinephrine, several substances have been synthesized in which the epinephrine molecule—being particularly open to chemical change—has been modified although the phenylalkylamine radical is retained. The synthetic substances differ appreciably in their activities.

Pharmacologic changes can be produced by slight modifications of the chemical structure; this is demonstrated by norepinephrine. The activity of norepinephrine is almost exclusively confined to the smooth muscle fibers which it causes to contract. Norepinephrine does not possess the hyperglycemic and tachycardiac properties of epinephrine, and it can, therefore, be used in preventing or combating surgical shock. Artificial modification of the epinephrine molecule benefits therapy and is not merely of theoretical interest.

Before World War II, K. Unna investigated a series of epinephrine derivatives in which there was only one hydroxyl group and in which the methyl group attached to the nitrogen of the side chain had been replaced by saturated aliphatic chains of varying length. It was noticed in the p-hydroxy series of epinephrine derivatives that the pressure-increasing action of the ethyl derivative was weaker than that of the methyl compound. The higher homologues of this series, especially the n-butyl derivative, had a depressant effect on the blood pressure. The butyl derivative, unlike the ethyl homologue, did not evoke a rise in frequency in the denervated heart if doses of 2 mg. were used.

This discovery led to the introduction of the n-butyl epinephrine derivative as a vasodilative agent. This was the first step in a new direction. By change in the molecular structure to increase the vasodilative action of epinephrine, a lower systemic toxicity was obtained, although the concentration of norepinephrine used in local anesthetic solutions is about five times that of epinephrine.

The special pharmacologic action and the easy applicability of isopropyl-norepinephrine justifies recommending the new substance for clinical evaluation. The outcome of the tests, made at the Pharmacological Institute of the University of Vienna, Austria, was favorable. Among the synthetically prepared compounds related to epinephrine, the drug with the most favorable properties for dental and medical practice was found to be "Duvadilan," 1-(4′-hydroxyphenyl)-2-(l′methyl-2′-phenoxythylamino)- propanol.

Pharmakologisches Institut, University of Vienna, Austria

Roentgenology

X-radiation reduction with 90-kvp technics

John H. Greene. *D.Radiog.& Photog.* 31:36-37 No. 2, 1958

During the early 1920's, dental x-ray apparatus became standardized to deliver 65 kvp (peak kilovoltage applied to the tube) at 10 milliamperes. This technic remained in use for many years. The only reduction in exposure time occurred when faster films were introduced. As late as 1956 most dentists were using a medium-speed film which required 410 milliampere seconds for a 14-film adult examination and 145 milliampere seconds for a 10-film child examination. Although a film four times as fast was available, it was used almost entirely with the long-cone technic, so that the milliampere-seconds were the same.

Since 1956, two advances have been made which allow for roentgenographic examination with much less radiation exposure. Manufacturers of x-ray equipment have marketed apparatus which will function at any point between 60 and 90 kvp. Two new films have been made available. The medium speed Kodak Periapical Radia-Tized x-ray film is now twice as fast as formerly. The Kodak Periapical Ultra-Speed dental x-ray film is three times as fast as formerly. By combining these advances—90 kvp and faster film—great reductions in the milliampere-seconds required for dental roentgenographic examinations can be made. It is now possible to make a 14-film dental examination with fewer milliampere-seconds than were generally used to make a roentgenogram of a single lower incisor with an intermediate-speed x-ray film.

Although by the nature of the roentgenographic examination the patient must receive a certain amount of exposure to radiation, it is possible for the dentist or his assistant to operate the x-ray apparatus without receiving any exposure.

The best protection comes from standing behind a lead screen; 1.8 mm. of lead provides a thickness adequate for any dental office. If only minimal space is available, the leaded screen can be hinged to the wall so that it will be out of the way when not in use. Two precautions should be observed:

1. The screen must have a lead glass window through which the operator can watch the patient. Otherwise, there will be a temptation to peek around the side of the screen, which will expose the head to radiation.

2. The screen should be low enough to protect the feet, high enough to protect the top of the head, and wide enough to protect the largest person using it.

Lead screens can be purchased from dealers in x-ray apparatus and supplies. Plywood with a built-in layer of lead and lead glass for the window are available from the same sources. The dentist should have his protective measures evaluated scientifically by one of the monitoring services. An x-ray equipment supply dealer can supply the name and address of the nearest monitoring service.

Eastman Kodak Company, Rochester, N.Y.

Past and present radiation exposure to radiologists from the point of view of life expectancy

Carl B. Braestrup. *Am.J.Roentg.* 78:988-992 Dec. 1957

The life span of radiologists has received considerable attention since the publication of Shields Warren's statistical studies *Longevity and Causes of Death from Irradiation in Physicians* (1956) and *Biological Effects of Atomic Radiation* (1957). Warren reported that the average age at death was 60.5 years for radiologists compared with 65.7 years for other specialists with no known occupational radiation exposure.

The average accumulated exposure dose received by radiologists using nonprotective equipment is about 100 r per year. With the present standards of protection, however, the yearly dose may be reduced to about 1 r.

The average life dose received by radiologists

can be assumed to be the mean for the two extremes, or about 2,000 r for 40 years. If the reduction in life span is proportional to the accumulated dose received, radiologists using adequate protective equipment need fear no significant reduction in their life expectancy due to occupational irradiation.

Personnel monitoring has proved of distinct value in reducing radiation hazards.

It is questionable, however, whether past results can serve for future evaluation of radiation effects. For this purpose a more sensitive detector is needed, with an accurate index of radiation quality. It is essential to determine the energy of the rays used in order to establish the absorbed dose in rads for the vital tissues which affect life expectancy.

Francis Delafield Hospital, New York 32, N.Y.

Parotid sialography: roentgenologico-surgical correlation in a series of 70 cases

R. A. J. Einstein and S. L. Perzik.
California Med. 88:98-102 Feb. 1958

Sialographic, clinical and surgical observations were correlated in a study of 70 patients with lesions of the parotid gland.

Although there are considerable anatomic variations in the size and shape of normal parotid glands and in the caliber and branching of the ductal system, it is not difficult in sialography to establish criteria of normal relationships. The normal appearance is that of a "winter tree" with evenly distributed branches gently tapering toward the periphery. A normal parotid duct is not more than 4 mm. in diameter. Abnormal findings fall in three groups: (1) space-occupying lesions, (2) extrinsic indenting masses and (3) abnormalities within the ductal system.

Sialography revealed 36 space-occupying lesions in the superficial lobe of the parotid gland, 14 in the deep lobe, and 3 in the accessory lobes. Two patients had diffusely infiltrating changes, nine had purely sialoangiectatic changes, and in six of the patients the findings were considered normal.

Operations for total or subtotal removal of the parotid gland were performed in 58 of the 70 patients. The sialographic diagnosis proved correct in 50 of the 58 patients. In three patients in whom the roentgenographic diagnosis was deep lobe masses, tumors in the pterygoid portion were observed at operation. The tumors were bulky and had an "umbrella" effect. In four other patients, the neoplasm was thought to involve the pterygoid and inferior portions, but at operation was found to be in the deep lobe. These masses all were located posteriorly. In one patient in whom the roentgenogram was interpreted as showing a normal gland, a small, superficial lymph node within the gland was observed at operation.

Sialography is a useful tool in distinguishing between extrinsic and intrinsic space-occupying masses in the parotid region. It permits differentiation between inflammatory lesions and neoplasms, thus eliminating needless surgical explorations. It alerts the surgeon to masses involving the deep lobe. It can be performed easily and causes little discomfort. Although sialography has limitations, it is an important diagnostic and preoperative aid in the management of parotid lesions.

300 South Beverly Drive, Beverly Hills, Calif.

The assessment of an oral hygiene campaign

D. H. Goose. *Pub.Health,London* 72:20-24 April 1958

It often is assumed that regular cleaning of the teeth after meals is likely to reduce the incidence of dental caries and that the avoidance of eating sweets between meals is desirable. A small pilot scheme involving these points was undertaken within the County of Northamptonshire, to assess: (1) how cooperative children are when they have been given detailed instructions regarding oral care, and (2) what reduction of decay, if any, results from such a campaign.

Four secondary modern schools, two town schools and two country schools, were selected. The test group was chosen from one town school and one country school, and comprised 62 boys and 61 girls; the control group, from the other two schools, consisted of 41 boys and 39 girls. The children were 12 years old. Dental examinations were made and the DMF rates established. The children of the test group were given a talk and demonstration on oral hygiene. Each child received a pamphlet on oral hygiene. A letter was sent to the parents asking their cooperation. The head teachers were given a copy of *Dental Health* published by the General Dental Council, and several dental posters to exhibit in the two test schools. Five months later this process was repeated. Ten months from the start of the campaign all the children were re-examined.

In the test group only one boy and eight girls (7.3 per cent of the total) had carried out the oral hygiene instructions. The boys in the test group showed a significant reduction in caries (of 38 per cent) as a result of the campaign, but the girls did not.

Some 8.4 per cent of all the children ate sweets immediately after meals only, there being no significant difference in this respect between test and control groups. It is likely to be difficult to influence this dietary habit.

The response to the instructions was poor, clearly indicating that a much more detailed campaign must be conducted. This will need the participation of local authority dentists, general dental practitioners, physicians, health visitors and teachers.

The reason that the girls showed no significant result was doubtless the fact that they practiced a good initial standard of oral hygiene before the study commenced.

Northamptonshire County Council Health Department, Guildhall Road, Northampton, England

Resistance to tooth decay

Charles Glen King.
1957 Rep.Nutrition Foundation 34-36 1957

Investigations of nutritional factors that influence resistance to tooth decay continued in 1957 at the University of Wisconsin and the Harvard School of Dental Medicine, under grants from the Nutrition Foundation. Numerous studies by both groups have demonstrated that a mixed diet of representative foodstuffs can achieve a fairly high degree of protection against dental caries in experimental animals.

The quality of protein intake and the intake of "trace" mineral elements, several of the vitamins, phenolic materials and fats normally contribute to the defense against dental caries and loosening of the teeth in a variety of experimental animals. The carious process and some types of gingival retraction result primarily from the attack of bacteria.

P. H. Phillips and his associates at the University of Wisconsin identified the protective role of organic materials in natural food products. The chief active ingredients were of a phenolic character; the fatty acids also were significant. The equipment used to measure the resistance of teeth to wear or abrasion has been improved.

J. H. Shaw and his associates at Harvard have continued their investigations of the effects of nutrition on resistance to caries. The intake of vitamins A and D had little influence on periodon-

tal lesions in the rat, but slight protective effects were observed with high intakes of vitamin B complex. Vitamin C had a pronounced effect on gingival retraction in guinea pigs, monkeys and men, but variations in calcium and phosphorus intake had no observable effect. There was no evidence of injury to animals when the fluoride intake was many times higher than would be supplied by human diets supplemented with fluoridated water.

Cynomolgus monkeys (much smaller than the commonly used rhesus monkey) offer distinct advantages for dental research, because of their size and their record of satisfactory breeding and growth under laboratory conditions.

99 Park Avenue, New York 16, N.Y.

Statistical evaluation of the caries incidence in school children of Wroclaw (Breslau), Poland

N. Wigdorowicz-Makerowa, A. Dadun and B. Plonka. *ORCÀ* 4:233-239, 1957 [in French]

School health inspectors in Poland report regularly on the incidence of dental caries in the school children of their districts. Research on the mechanism of the anticaries action and the caries-preventive effect of fluoride necessitated an independent statistical investigation and evaluation of the caries incidence in school children of all Polish districts.

At the department for dentistry of the medical faculty of the University of Wroclaw, the teeth of 5,864 school children of both sexes, from 7 to 13 years old, were examined and the data statistically recorded.

Because the criteria for a "perfect dentition" is always subjective, children from school districts in which "no caries" was reported or from those furnishing insufficient data were excluded.

A statistically significant difference existed between the caries incidence in the upper teeth and in the lower teeth in the majority of children examined. The investigation of this phenomenon led to the following conclusions:

1. This difference, observable in caries-resistant and caries-susceptible children, depends on the age and the type of teeth.

2. At the "characteristic age" in which the caries incidence in upper teeth and lower teeth is almost the same, the data are entered on the curve of divergence at the "characteristic point."

3. This point is characteristic for every group selected from the city's population. Variations from this norm, therefore, are registered left or right, above or below the characteristic point. Thereby a formula can be established for the resistance or susceptibility to caries of the entire population.

4. The method of establishing and evaluating the characteristic point can be used successfully for measurements of the caries incidence of a specific group of children, or for assessing the caries reduction caused by a specific factor such as fluoridation.

Z Zakladu Stomatologii Zachowawczei, Wroclaw, Poland

Fruit drinks and tooth erosion

P. J. Holloway, May Mellanby and R. J. C. Stewart. *Brit.D.J.* 104:305-309 May 6, 1958

The present study was undertaken to determine whether the types of fruit squashes [soft drinks with fruit juices] sold in Great Britain erode the teeth. Tested were 20 proprietary brands of fruit squashes and cordials, several brands of cola-type and other aerated drinks, bottled and fresh fruit juices, acidulated sweets, iced lollipops and similar confections. A few experiments were made on dogs, and also on animal and human teeth *in vitro*, but for the most part rats were used. The test fluids (20 ml. per rat per day) were their sole drink. Several groups of four rats, each of the four having the same test fluid, were included in the experiment; to provide a link between the various tests, one of the groups in each series was given a standard solution of 0.5 per cent citric acid and 5 per cent sucrose. At the end of the experimental period, the animals were killed and the jaws prepared for examination of the molars by the methods of Restarski and others (1945), whose standards for enamel erosion also were adopted. The following conclusions were reached:

1. Fruit drinks sold in Great Britain cause

erosion of rats' and dogs' teeth *in vivo* and of human and dogs' teeth *in vitro*.

2. Modification of the form in which these fluids are taken (as sweets or frozen lollipops) does not reduce erosion and may increase it.

3. The aerated drinks are not as erosive as fruit squashes or acid-sugar solutions of similar pH and titratable acidity.

4. The amount and type of sugar included in the drinks may modify the degree of erosion produced.

5. Sodium fluoride (even at a level of 2 ppm fluorine), and sodium oxalate, when included in the drinks, reduce their erosive power.

6. In man, under special conditions, fruit juices may damage tooth enamel. This is most likely to occur in children.

Medical Research Council, London, England

A system for fluoridating individual water supplies

Franz J. Maier. *Am.J.Pub.Health* 48:717-723 June 1958

About 60,000,000 people living in 20,000,000 homes in the United States are being served by private, individual water sources—principally wells. Probably fluoridated water from a public source will be unavailable to almost a third of the people of this country.

A practicable device has been developed to fluoridate a private water supply safely and effectively. The device has been used during the past two years in four homes in a suburban area of Maryland. The device is installed near the well pump. During most of the period of testing, the units were serviced each month. At each visit the feeders were tested, the fluoride solution was measured and replenished, necessary repairs made, water samples taken for fluoride analysis, and water consumption noted. The feeders generally operated satisfactorily. Occasionally, minor repairs had to be made, but the safety of the procedure from the point of view of overdosing was not affected. The delivery of fluoride solutions at the settings chosen was remarkably constant and precise.

Experience with the device indicates that a satisfactory fluoride level can be achieved in home water systems if the installations are properly maintained and adjusted periodically. A service group could be employed to provide fluoridated water to owners of private water systems. A servicing organization similar to those now providing chlorinated, softened or bottled water could supply and maintain the fluoridation equipment and be responsible for the entire installation. Such a service organization would analyze the untreated water, provide, install and maintain the feeding equipment, periodically inspect the installation, replenish the fluoride solution and check the dosage, and eventually remove the equipment when no longer needed. In certain areas where conditions warrant, the service might be provided by the local health department. Such a service possibly could be provided at a cost of about $3 a month per installation.

U. S. Public Health Service, Washington 25, D.C.

The effect of pilocarpine in single or divided daily doses on incidence of dental caries in the rat

Joseph C. Muhler and David Bixler. *J.D.Res.* 37:410-411 June 1958

One hundred and sixty weanling Sprague-Dawley rats were divided into four equal groups. Groups 1 and 2 received 2 mg. of pilocarpine nitrate daily by stomach tube. Group 1 received the pilocarpine in a single dose and Group 2 received it divided into three doses, spaced about four to five hours apart. Group 3 received the pilocarpine as a constituent of the diet, at a level designed to furnish 2 mg. a day per rat. Group 4, the control group, received no pilocarpine. After 140 days the animals were sacrificed and the heads removed for dental caries evaluation.

The data indicated that all three experimental groups had a significant reduction in dental caries. The anticariogenic effect of pilocarpine does not seem to be related to frequency of ingestion, but may be related to differences in the chemical composition of the saliva after pilocarpine administration.

Indiana University, Bloomington, Ind.

Dentistry's opportunities in the field of oral health

Thomas J. Hill. *W.Virginia D.J.* 32:11-14 Jan. 1958

The first purpose of a school of dentistry is to train practitioners who can render to the public a skilled service based on the science and art of their training. The services that they perform will reflect the training program of their school. The dental school must develop an educational program which will teach the modern concept of dental disease and the most advanced technics for reparative and restorative services. The faculty must also teach the concept that every professional man has a duty and an obligation to render first a health service. The training should not consist of what is good for the student or the professional man, but of what is best for the patient.

The obligation to perform an adequate health service is broad. It involves a service which goes beyond the walls of the dental office—the education of the patient and the public in principles of oral health. The dental school should alert its students to their responsibilities and arouse in them an intelligent interest in the oral health of the community, the rich and the poor, the handicapped child, the persons with cerebral palsy, cleft palate and severe malocclusion. These severe handicapping defects affect the physical, social and economic life of the whole community.

The second purpose of a dental school is to provide graduate and postgraduate training. To understand diseases such as dental caries and periodontal disease, one must have training in the relevant sciences. Dental education must develop not only practitioners but leaders in dental education, investigators in dental research and men who will develop community programs of public health.

The third purpose of a dental school is to contribute to the fund of knowledge related to the cause and treatment of oral disease. Every school which is a member of a university family is obligated to carry its share of responsibility for dental research. The value of research to a university is not confined to the additions that are made to the fund of knowledge. Research engenders a progressive spirit in the teaching staff; it develops an inquiring attitude in the student; it is a vital part of graduate education and is necessary for university life and growth. Dental research should become the connecting link between the basic sciences and clinical problems.

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Some impressions from a study trip to Great Britain in 1956

Olof Palmqvist. *Svensk tandläk.Tskr.* 50:219-232 April 1957

There are 16 dental schools in Great Britain—five in London, seven in other parts of England, three in Scotland and one in Ireland. Dental degrees also can be obtained from the Royal College of Surgeons of England, the Royal College of Surgeons in Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow. For postgraduate training there is the Institute of Dental Surgery affiliated with the Eastman Dental Hospital in London.

The theoretical and technical training is carried out at the dental schools and the clinical training is completed at the dental hospitals which usually are part of a larger medical center and often located a considerable distance from the dental school.

The dental schools are all affiliated with universities, whereas the dental hospitals are related to the Ministry of Health. This system has some drawbacks. The intimate connection with universities—which for some of the dental schools is of recent date—is important, as it gives opportunities for valuable cooperation with the medical departments, and makes greater research facilities available to the dentists.

The dental schools in Great Britain have a capacity of about 640 students a year, but after 1950 the actual number graduated annually has

been only about 520. Women dentists make up 8 per cent of the number of practicing dentists; in recent years, up to 15 per cent of the dental students have been women. Great Britain has a shortage of dentists; with 15,000 dentists, the ratio is about one dentist per 3,300 inhabitants. Only 200 to 300 of the dentists have a purely private practice; the rest are to a greater or lesser extent affiliated with the National Dental Health Service. The great cut in income for dentists within this service has resulted in a diminished interest in dentistry as a profession. Also, the social status of the dentist does not seem to be as high in England as, for instance, in the United States or Sweden. An effort is being made, through improved training, to bring dentistry into higher esteem.

For a "License of Dental Surgery" the study time normally is four and a half to five years, but there is an increasing tendency to seek the higher degree of "Bachelor of Dental Surgery" for which the study time is increased by from 6 to 12 months; the courses in such subjects as physiology, anatomy and biochemistry are the same as for medical students. The tendency is toward an increased emphasis on the biological aspects of dentistry. Although physicians have the right to practice dentistry, few take advantage of this privilege without first obtaining special dental training.

In the past, dental care in Great Britain was dominated by extraction therapy and replacement of the missing teeth with a prosthesis. Now a change has occurred. Pedodontics, orthodontics and periodontics today make up a considerable part of the dental curriculum. The previous extensive course in dental mechanics has been reduced from 2,000 to 800 hours and has been correlated with clinical work in prosthodontics. For certain details of the technical work on prosthesis, such as casting and polishing, the dental student benefits from the help of technicians; in this way, the student can treat a greater number of patients. The student, however, first must prove himself capable of carrying out the complete procedure on his own.

Previously, crown and bridgework were insignificant for the average British dentist, but the present teaching aims at bringing these subjects up to modern standards. Bridgework is carried out to a limited extent by the students. The preference for removable dentures is noticeable.

The tendency is to employ more full-time teachers to secure continuity in instruction and research. It is considered important, however, to employ also some part-time instructors who will be able to add fresh viewpoints from their experiences in private practice.

The possibilities for graduate work in England are good. The degree of "Master of Dental Surgery" (M.D.S.) can be obtained in all of the 19 institutions, at the earliest after two years of postgraduate training. The degree of "Doctor of Dental Surgery" (D.D.S.) can be obtained at Manchester. This degree is here an advanced degree and thus is not the equivalent of the American D.D.S. The opportunity to obtain a Ph.D. also is open to dentists. Furthermore, after special training a dentist can obtain diplomas in several specialties, such as in public dentistry and orthodontics.

The dental schools in Great Britain are making every effort to raise dental education to the highest modern standards.

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Training programs for dental assistants

James A. Yaeger. *J.D.Educ.* 12:162-176 March 1958

It is reasonable to assume that a dentist's productivity can be more than doubled, perhaps tripled, by employing a trained chairside assistant and a clerk or secretary in a two-chair office. Maximum efficiency can be gained if the assistant is trained and employed solely at the chairside.

Training for an assistant should include the basic sciences, clinical dental procedures, roentgenology and clinical experience.

The faculty of a dental school, aided by dental hygienists or trained assistants, could participate in presenting such a course. The clinical experience gained in a dental school clinic creates an opportunity to orient the dental student in the most effective methods for utilizing the assistant. The value of this training for the dentist would be as significant as that for the assistant.

A survey of existing courses for dental assistants indicates that the most impressive programs

are offered by junior colleges in collaboration with dental schools. Training programs currently offered perhaps are adequate to aid assistants already employed. Nevertheless, several are judged inadequate to provide the clinical training necessary for the assistants to be of maximum service to a dentist trained in the effective utilization of an assistant.

A proposed program of training for presentation in a dental school has a curriculum of 621 hours, divided as follows: anatomy and tooth carving, 20 hours; oral pathology and bacteriology, 10; operative dentistry, 49; crown and bridge, 10; prosthodontics, 30; oral surgery, 10; periodontics, 4; endodontics, 3; pedodontics and orthodontics, 5; roentgenology, 20; ethics and jurisprudence, 1; office management and bookkeeping, 3, and clinical experience in chairside assisting, 456. The program may be presented in one academic year or less. The distribution of time would permit dental assistants presently employed in a dental office to enroll in the didactic and laboratory courses, and to receive credit for previous clinical training. The program could be expanded to one full-time academic year when teaching clinics are organized to accept student assistants for longer periods.

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Dental hygiene aptitude test

Patricia A. Clendenin. *Baylor D.J.* 8:17-19 Spring 1958

Nearly 5,600 dental hygienists were employed in the United States in 1956. These dental hygienists were trained to perform prophylaxis, to apply topical sodium fluoride, to make dental roentgenograms and to assist the dentist in performing various procedures concerned with the care and treatment of the patient. The dental hygienist works under the direction of the dentist to polish and scale teeth. She serves as a dental health educator, teaching proper home care and giving advice on diet. The services a dental hygienist can perform in a dental office may account for as much as a quarter of the dentist's time, thus freeing him for more highly specialized procedures. Most dental hygienists work in private dental offices, but some work in hospitals, clinics, industrial plants, public school systems, state and federal health departments, and in research.

There are 34 dental hygiene schools located in 24 states. Admission is limited to women. The applicant must be a high school graduate; more and more schools give preference to applicants with one or more years of college. In 1956 the enrollment at dental hygiene schools was 2,104.

A dental hygiene student mortality study was made by the American Dental Association for classes beginning in 1952, 1953 and 1954. The study showed a need for a dental hygiene aptitude test. In the first year, 12.1 per cent of the students withdrew; in 1954, 13.8 per cent of the students dropped out. More students left school because of poor scholastic records than for any other reasons. A dental hygiene aptitude test will provide a basis for accepting only those applicants who show a reasonable potential for becoming dental hygienists.

In October 1957 Baylor participated in the first dental hygiene aptitude test for applicants (Baylor also participated in two trial aptitude tests given in 1956 and 1957). Some of the areas measured by the test are: (1) ability to reason with numbers; (2) ability to use and understand words; (3) general knowledge in the fields of elementary biology, chemistry and social studies, and (4) ability to read, organize, analyze and retain information. Six personality characteristics which the tests measure are achievement, orderliness, persistence, congeniality, altruism and respectfulness.

The American Dental Association's Council on Dental Education reported that in 1953, 2,053 applications were received by 31 dental hygiene schools, with only 1,010 accepted. In 1956, 2,825 applications were received for the available 1,152 places in 35 schools. At Baylor, 55 applications were received for the first class of 32 in 1955; 74 applications were received for the fall class in 1957, and 90 applications for the September 1958 class had been received by April 1958.

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Dentistry around the world

Dental activities in the Republic of China

J. L. Wong. *J.A.D.A.* 56:725-726 May 1958

Scientific dentistry was introduced to China by Canadian missionaries in the early 1890's. Dental education at the college level began in 1918, when Ashley Lindsay of Canada organized the first class in the college of dentistry in West China Union University, in Szechuen. In 1919, Loyola University of Shanghai, a Roman Catholic institution, started its dental school. In 1933 the government of the Republic of China commissioned the author, a 1922 graduate of the University of Minnesota, to institute the First National Dental College at Nanking. Since 1922 the college has offered a six-year course leading to the degree of Bachelor of Dental Surgery, and has graduated more than 200 dentists, most of whom are practicing in China.

During the third year of the Chino-Japanese war, in 1940, the author established a hospital in the First War Zone, at Loyang in the province of Honan. Training classes for military dental auxiliaries—chair assistants, dental hygienists and technologists—were started at the hospital in 1941.

After V-J Day in 1945, large-scale training was begun in Shanghai of military dental surgeons, each of whom receives a Bachelor of Dental Surgery degree and a first lieutenancy in China's armed forces on successful completion of the six-and-a-half year course. The author was appointed dean of the dental college. Most of the teaching staff of 17 were graduates of American dental schools, or received their training from U.S. Army Medical and Dental Training Centers. The dental department accommodated 150 students.

When the Communists invaded the mainland in 1949, the National Defense Medical Center (including the dental school) was evacuated to Taipei, Taiwan (Formosa). With the assistance of the United States military advisory government aides, the dental school was rebuilt. Many of the graduates now are taking advanced dentistry courses in the United States.

In 1954 the first civilian dental school was established at National Taiwan University. The first class will be graduated from the seven-year course in 1961; the output after 1966 is expected to be 10 to 15 graduates a year.

The Kao-Hsuing Medical College, privately operated by C. M. Tu, formed a dental department in 1956, with an enrollment of 40 freshmen in the seven-year course. At the Tai-Chung Vocational School, incorporated in 1957, a four-year dentistry course is offered; graduates receive a diploma and a government license to practice. The government Public Health Service has established free dental services in schools, factories and public health centers.

A seven-member National Board of Dental Examiners was authorized in 1954 to examine all candidates for license to practice.

Taipei, Taiwan (Formosa)

Forensic dentistry

Supreme Court modifies lower court decision

Washington D.A.Newsletter 5:5 April 1958

The Washington State Supreme Court has upheld a lower court's award of $450 for breach of a guaranty involving the satisfactory fit of partial dentures, and has reversed the award of $750 for pain and suffering allegedly resulting from the improper fit. The plaintiff alleged that the dentist, of Spokane, had agreed to make partial dentures to the plaintiff's complete satisfaction. The defendant denied having made such an agreement. The plaintiff further contended that the dentures were not made to her satisfaction and that as a result she suffered discomfort and pain.

In modifying the lower court's decision, the Supreme Court held that the amount paid is the consideration for the promise of the professional

man that the patient will be satisfied with his work. Having made such a promise, he must, in the event of a breach of the promise on his part, contemplate the loss of the consideration, and the patient is entitled to recover the amount paid for the services which are unsatisfactory.

However, with respect to the damages for pain and suffering, the court held that such damages ordinarily are predicated on a claim of negligence or malpractice, and were not within the contemplation of the parties for the breach of a promise to do work to the satisfaction of a patient, in the absence of a finding of fault or negligence.

In the opinion of the attorney for the Washington State Dental Association, this case does not establish a precedent injurious to the profession.

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Latin American dental journals of the XIX century

E. Salles Cunha.
Rev.A.odont.Argentina 45:207-208 June 1957

An interesting article under the same title as that of this article was published by Dr. C. Mena Serra in the October 1956 issue of *Revista de la Asociación Odontológica, Argentina* (DENTAL ABSTRACTS 2:162 March 1957). It discusses the chronologic priority in the publication of dental journals in the Spanish and Portuguese languages. In reference to the contribution from Brazil, Dr. Mena Serra quotes Salvador Lerman, a Latin American historian of dentistry: "A dental journal under the name of *Arte Dentaria* started publication in Rio de Janeiro under the editorship of Dr. J. Borges Dinis in 1869."

The data given by Salvador Lerman have been verified. They were given in an article "The Evolution of Odontology in Brazil" (A evolução da odontología no Brasil) which was presented by Dr. Salles Cunha and collaborators before the third Latin American odontologic congress in Rio de Janeiro in 1929.

Several odontologic journals started publication in Brazil during the colonial days but few of them continued publication to the present days.

The chronologic priority of Brazilian dental journals is as follows: *Arte Dentaria,* 1869; *Revista dentaria,* 1877; and *Union Dentaria,* 1883. All three journals served the fields of dentistry, surgical treatment of diseases of the mouth and dental prostheses. *Arte Dentaria* was published in Rio de Janeiro. A copy of the first issue is preserved in the National Library in Rio de Janeiro. *Revista Dentaria* also was published in Rio de Janeiro. It discontinued publication in 1879. *Union Dentaria* was published in the city of Salvador, capital of the Bahia Province, under the editorship of Dr. Bonifacio Costa. A copy of this journal is preserved in the files of the journal *Brazil Odontologico.*

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General

Grounding of portable electric equipment used in dental offices

Neal A. Smith. *J.A.D.A.* 57:17-23
July 1958

Hazards from electrical shock are likely to exist in a dental office both for the patient and the dentist. These hazards can be minimized by examining each piece of electrical equipment and finding the best way to prevent shock in each instance. The National Electric Code recently has been modified to cover portable electric equipment adequately.

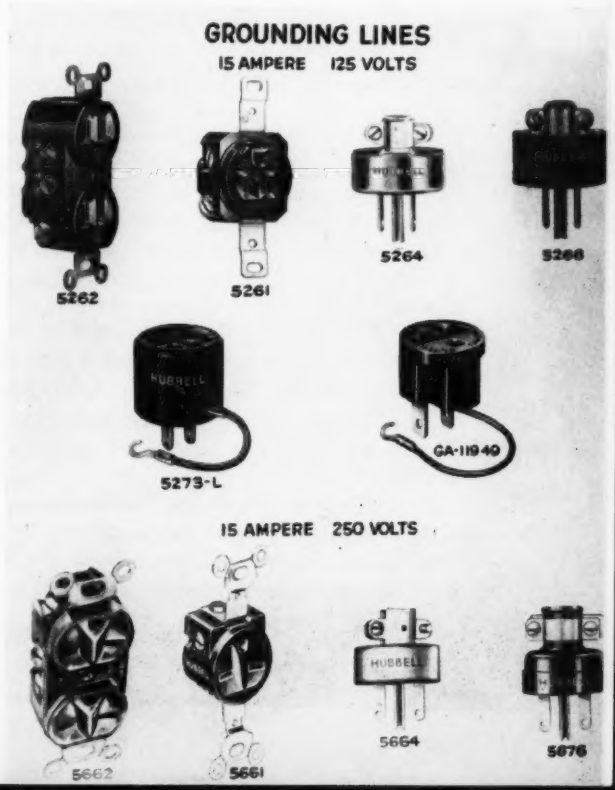
The possibility of shock from defective electrical equipment in the average dental office is due to the nature of the normal wiring system in the United States. One of the two or three wires for alternating current service is grounded at the service entrance to the building, by being bonded to a water pipe. If a person touches the wire already connected to the pipe, no shock will be experienced. If he touches the other wire which is maintained by the power system at a potential of 120 volts with respect to the grounded conductor, then an electric current can flow into the victim's body at the point of contact with the wire and out at the point of contact with the plumbing fixture. The severity of shock will be determined by the resistance of the subject; in general, the firmer the contact and the more moist the skin, the greater the shock.

If the metal case of a piece of electrical equipment is touched on the inside by a bare "hot" supply wire, the metal case will be at the same voltage with respect to ground as the "hot" wire, and will be just as dangerous. The requirement for shock is the simultaneous touching of a "ground" and a "hot" wire. There are areas in the dentist's office where plumbing is present in the vicinity of electrical equipment.

What can be done to safeguard the user of electrical equipment when in the vicinity of grounded surface? Perhaps the safest solution is to cover up all metal surfaces with insulation, but this is not always practicable. Another solution is to keep all the bare metal surfaces on the electrical equipment at ground potential by connecting each one to ground with a wire. Another solution is to locate the electrical equipment out of normal reach of the patient and of the dentist or team in the course of dental work, assuming that the grounded metal of the chair, its fixtures, and instruments will be unavoidably accessible to the touch.

New requirements of the National Electric Code provide in part for abandonment of the old-style 2-prong plug with "pigtail" and adoption of a new 3-prong plug with the third prong used for grounding having a U-shaped design such that it will not fit any previous grounding terminal or any "live" contact of any existing female receptacle. The illustration shows a number of wiring

New lines of plugs, receptacles and adapters meeting the 1956 National Electric Code grounding requirements. Note shape and spacing of three prongs. (Illustration courtesy of Harvey Hubbell, Inc.)



devices manufactured by Harvey Hubbell, Inc., for use in grounding under the new code requirements. The shape and spacing of the three prongs are of interest. The 125-volt devices have two parallel prongs or slots. The slot size and spacing allows the new grounding receptacles to accept a standard parallel blade nongrounding plug. Thus the new design is "compatible" with past practice. The tandem arrangement of blades in the 250-volt device makes it impossible to mix the two different voltage lines. The grounding blade is longer than the other two so that the grounding connection will be made first when the plug is inserted into the receptacle, before it is possible to energize the portable equipment. The grounding contact also is the last to be broken when the plug is removed from the receptacle. The two pigtail adapters in the center of the illustration are approved for adapting a new 125-volt grounding plug to the old-style receptacle designed for use with a plug with the "pigtail" grounding lead.

If a pedestal is used in the dental office which has both plumbing and electrical connections, the grounding is automatically done when metal piping is used. If rubber hoses are used, however, an electrical grounding wire should be used to make the grounding positive. Any equipment mounted on the pedestal—such as the drill or working light—usually is grounded by the pedestal ground. On the other hand, if the drill and working light are mounted separately, they should be grounded individually as long as they can be easily touched by a person in contact with grounded surfaces. Thought should be given to the possibility of shock from the sterilizer, which might be removed from the grounded area or grounded.

Only a competent electrician with adequate test equipment can install and test such grounded equipment so that the user is assured of the safety which grounding is designed to give. If any doubt exists as to the application of grounding in a particular situation, the local electrical inspection bureau should be consulted.

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Scientific development and methods in practice

George C. Paffenbarger and R. L. Bowen.
J.A.D.A. 56:785-789 June 1958

This article, one of four in a symposium on "dentistry in 1967," forecasts scientific developments and changes in the practice of dentistry which may appear during the next decade.

The percentage of the population who will be protected with the fluoridation program will continue to increase. The routine treatment of the surface of the teeth of young patients with remineralization agents or synthetic impregnating or coating materials may become a routine procedure. The process of nutrition and its effect on the teeth will receive more attention. The prophylactic use of antibiotics in oral surgery on patients with valvular heart disease or with a past history of rheumatic fever will increase, as will the antibiotic therapy of acute and chronic dental or oral infections. Antienzymes may be developed as effective anticariogenic agents. Dentists will take more time to teach good oral hygiene methods to patients. Operative dentistry, as dentistry's foremost preventive measure, will be emphasized. Prevention will become a keynote of general practice. New roentgenographic technics will find their way into private dental practice. The technic of transillumination will be reemphasized. New instruments and technics may be developed to help the dentist better diagnose pulp conditions.

Improved methods for removing enamel and dentin will evolve and will encourage people to seek dental service. The conservative treatment of periodontal diseases will continue to predominate over the surgical and splinting technics.

Amalgam, as the dominant filling material, will be challenged by gallium-based alloys. New types of synthetic resins with possible applications as direct filling materials will be developed.

Plastic teeth, which today account for about 25 per cent of the total number of artificial teeth sold, will not displace porcelain teeth to any

greater degree. Polymethyl methacrylate will continue to be the first choice as a denture base resin, but may be challenged by epoxy resins. Soft relining resins will be used more extensively. The use of indirect methods for taking impressions will be accelerated.

Basic and applied dental research will be greatly stimulated. Much of this research will center around the structure of the teeth, the saliva, nutrition, the flora and fauna of the mouth, the formation of calculus, the mechanism of fluorine protection, the cause of dental caries, and how and why supporting tissues of the teeth are lost. New methods of treatment and new and improved materials and instruments will be evolved.

American Dental Association, National Bureau of Standards, Washington, D.C.

Lest we forget

Jack S. Rounds. *J.South.California D.A.* 26:209-211 June 1958

The busy dentist who adds improved office equipment and attempts to better his technics and his office efficiency may forget the simple social fundamentals which he once emphasized and which were so important in building his practice. These fundamentals include the appearance of his office, the appearance of himself and his office personnel, and the manner in which patients are handled.

The phone personality of the dentist's secretary or assistant shapes the patient's vision of the future dental appointment. Many patients may be apprehensive about dental treatment, and the office personnel should act to make all patients confident that their treatment will be gentle and considerate. A nervous dentist acting as though he were behind schedule cannot make a patient glad to enter the operatory.

The appearance of the reception room should be tasteful, restful and neat. The receptionist should be neatly attired and pleasant, and should attend each patient promptly. When the patient enters the operatory, the dentist "passes in review." If he is neat, well-groomed, has a smile and speaks the proper words, a great start has been made. An assuring manner with a sincere interest in the new patient's dental problems stimulates confidence. The diagnosis of a patient's dental problem must be made with care, skill and judgment, for this is a crucial point in the patient-dentist relation. Both must be in accord as to general procedures. Approximate fees, time and schedules should be discussed. The proper use of psychological premedication will lessen the need for medical premedication.

The use of lip lubrication before working in the mouth helps prevent postoperative mouth discomfort. A good formula for a lip lubricant is as follows: white petroleum jelly, 3 parts; wool fat, 1 part; oil of wintergreen, 10 minims; oil of anis, 10 minims, q.s. 8 ounces.

The dentist should explain what is to be done in a manner that will be understood. If possible, an easy operation near the anterior of the mouth should be carried out at the first appointment. The dentist should avoid leaning on the patient. The patient's lips and cheeks should be moved slowly and gently. Solid finger rests are essential in using all hand instruments. The handpiece never should be placed in the mouth with the bur or stone rotating. Careless handling of instruments should be avoided. The type and length of conversation with patients are important. The patient is interested in getting the work done; all chair time should be concentrated on the patient. The operator should not leave the patient for the telephone, salesmen or friends except when a matter appears to be urgent. Conversation with the chair assistant should be limited to the operation or to something relating to the patient. The dismissal of the patient should be pleasant. Future dentist-patient relations depend largely on the mutual understanding established in the early, crucial appointments.

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Experimental studies on corrosion resistance of various dental alloys, chiefly in the saliva and several foods

Tetsuya Kanatake. *Shikwa Gakuho* 58:4:1-8 April 1958

Twenty-two kinds of dental alloys used in Japan were tested for their ability to resist corrosion. The alloys were tested in saliva, in several foods, in acid and alkali solutions and in some medica-

ments. The alloys were dipped in the solutions, after which the surface condition and the loss of weight were ascertained. Alloys were also tested electrochemically.

Fourteen-carat gold alloys, even those without platinum, resisted corrosion, but sometimes changed color slightly. Silver-palladium alloys resisted corrosion. Cobalt-chromium alloys, nickel-chromium alloys and 18:8 stainless steels were stable in some foods. Silver cast alloys were passive in some foods and had a high negative potential in saliva. Copper alloys, tin-antimony alloys and silver amalgams were inferior to other alloys in resisting corrosion. Some alloys reacted severely to immersion in saliva. Some alloys were corroded by orange juice and lactic drinks. Some alloys were corroded by weak solutions of iodine tincture.

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Mouth-to-mouth versus manual artificial respiration for children and adults

Arthur S. Gordon, Charles W. Frye, Lloyd Gittelson, Max S. Sadove and Edward J. Beattie, Jr. *J.A.M.A.* 167:320-328 May 17, 1958

An investigation of manual and mouth-to-mouth methods of artificial respiration in infants and small children was undertaken by the authors under the auspices of the National Academy of Sciences-National Research Council, supported by the American National Red Cross. A similar evaluation in adults was undertaken under a research contract with the U.S. Army Chemical Warfare Laboratories, and the results of both investigations are reported.

In infants and children the following methods were evaluated: back-pressure arm-lift, chest-pressure arm-lift, back-pressure hip-lift, manual rocking, and mouth-to-mouth insufflation. The studies were performed on normal infants and small children who were admitted to the hospital for elective circumcision under general anesthesia. Prior to the surgery, a series of artificial respiration methods was performed on them while they were anesthetized and temporarily apneic from hyperventilation and small doses of succinylcholine chloride. The studies demonstrated the unequivocal superiority of mouth-to-mouth breathing over all manual methods of resuscitation for infants and small children.

Extension of these studies to adults involved use of similar experimental designs and methods. Three push-pull manual methods—back-pressure arm-lift, back-pressure hip-lift and chest-pressure arm-lift—were compared with direct mouth-to-mouth resuscitation on a series of eight normal adult male subjects who were temporarily apneic from administration of succinylcholine chloride while under general anesthesia. All methods were tested on each subject. Tidal volumes and airway pressures were measured. Again, the unequivocal superiority of mouth-to-mouth resuscitation over all manual methods was demonstrated. Mouth to-mouth breathing is the only technic which assures adequate ventilation in all instances. With the manual push-pull methods and manual rocking, complete obstruction of the airway occurred in a significant number of subjects; partial airway obstruction was noted in all of the other subjects.

The single most important factor in assuring adequacy of ventilation is proper extension of the neck and elevation of the jaw. The most useful technic for performing mouth-to-mouth breathing in infants and small children involves a specific series of actions; this is also true of the best technics for performing direct mouth-to-mouth and mouth-to-nose resuscitation on adults.

Presbyterian-St. Luke's Hospital, Chicago, Ill.

Treatment of acute ulcerative lesions of the oral cavity

Everett C. Claus, Jay T. Estep and Balint Orban. *Oral Surg., Oral Med. & Oral Path.* 10:1176-1182 Nov. 1957

Fifteen patients with ulcerative lesions in the oral cavity were treated with 9-alpha-fluorohydrocortisone and observed. The method of treatment was the same in all patients. The lesions were isolated by blocking off the region with gauze packs. The lesions were dried thoroughly and kept dry during treatment. The 9-alpha-fluorohydrocortisone ointment was applied to the lesion and gently massaged with a gloved finger for five minutes. In most instances, the relief from pain

was rapid and the healing of the lesion was much more rapid than previously experienced with other treatments. The number of treatments varied with the severity of the lesion.

The number of cases reported is small, no controls were used, and only clinical observations were made.

Veterans Administration Hospital, Denver, Colo.

Leprosy and dental treatment of leprous patients

Ernesto Cohn. *Deut.zahnärztl.Zschr.* 13:1042-1045 May 15, 1958

Leprosy is a chronic, mildly communicable disease which varies in its prevalence in different parts of the world. It is caused by *Mycobacterium leprae,* an acid-fast microorganism. In West Europe and the United States, conditions favorable to the propagation of leprosy exist only in the extreme southern areas. In the United States (in 1950), there were only 400 instances of diagnosed leprosy, although it was estimated that from 1,000 to 2,000 additional instances were not recognized.

The exact means by which leprosy is transmitted from man to man is unknown. Epidemiologic studies indicate that it is a familial disease spread by direct contact and that no intermediate host is essential to transmission. A long continuous or repeated exposure to a leprous patient is required for transmission. Poor nutrition, filth and squalor may be relevant factors in the disease's spread.

The incubation period of leprosy is long but varies greatly. From 1 to 20 years may elapse between exposure and the appearance of clinical symptoms.

The main clinical manifestations are skin discoloration, loss of sensation and atrophy. The cutaneous (lepromatous) type, caused by large numbers of *Myco. leprae,* is recognized as infectious and is characterized by severe disfigurements such as "claw hands" and "leonine faces."

Although leprous ulcerations in the oral cavity are comparatively rare, they do occur and are accompanied by severe changes in the functions of speech and mastication.

Dental treatment of leprous patients is not essentially different from that of other patients. During the treatment of such patients or of those suspected of having leprosy, the dentist must take preventive measures such as wearing surgical gloves and sterilizing thoroughly all instruments used, his gowns and all objects touched by the patient. Repeated washing and scrubbing of all exposed skin parts, changing of gowns and other articles of clothing are the main precautions required. The danger of transmission of leprosy from patients to the dentist, however, is not nearly as fearsome as the disease's repute would indicate. Direct contact with open wounds, especially of the face or within the oral cavity, must be avoided.

Because there may exist many instances of unrecognized leprosy, and patients afflicted with a milder type of this disease usually are afraid to disclose it even to their dentist or physician, any patient who shows suspicious symptoms should be immediately referred to a dermatologic center, and the instance brought to the attention of the public health authorities.

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Removal of spots from dental gowns

Zahnärztl.Praxis 9:113 May 15, 1958

Q.—Which method can be recommended to remove flavin, iodine or blood spots from white dental gowns?

A.—Flavin spots may be treated with diluted hydrochloric or sulfuric acids. The gowns, however, must be thoroughly washed and scrubbed immediately after application of the acid solutions.

Iodine spots can be removed by touching them with sodium thiosulfate and by adding a diluted ammonia solution to the liquid in which the gown is to be washed.

Blood spots, if they are comparatively recent, can be removed by washing the gown in cold or lukewarm water. Hot water should never be used for this purpose. Blood stains which are relatively old usually vanish after bleaching with hydrogen peroxide.

13b München-Gräfelfing, Germany

New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

A new "Quiet-riter Eleven" portable typewriter has a standard 11-inch carriage, can handle full-sized letterheads lengthwise and can type a standard line of 10.3 inches. The 44-key, 88-character keyboard is identical with the keyboard on the standard office typewriter. Key top size, between-key spacing, slope and over-all dimensions of the keyboard are standard. The typewriter is available in four colors—white sand, mist green, French gray and desert sage. *Remington Rand Division, 315 Fourth Avenue, New York 10, N.Y.*

A wide, nonglare, disposable "Sanek" towel for dentists will be introduced shortly. The towel is tinted green to absorb the glare from the examination light. The towel measures 19 by 14 inches and will be packed 500 to the case. The towel has been tested by dentists in six cities for nine months and has been found satisfactory. *Kimberly-Clark Corp., Neenah, Wis.*

Disposable plastic headrest covers fit any headrest on any dental chair. The covers are lightweight, disposable, stainless, comfortable and inexpensive. They are available in packages of 500 each. Samples and literature are available. *General Approved Products, 920 Walnut Street, Philadelphia 7, Pa.*

A 24-page catalogue describes almost every laboratory utensil or container made of vinyl, polyethylene, polypropylene, acetate, Teflon, nylon or other plastics, that is now available. The 8½ by 11 inch catalogue lists thousands of items, indexed and with prices. *Bel-Art Products, 4917 Murphy Place, West New York, N.J.*

A new, lightweight resuscitation truck is designed to make emergency oxygen quickly available in dental offices, hospitals and clinics. The rubber-wheeled, steel unit has a baked enamel finish of silver-green. Two rubber-cushioned retaining rings hold a size E cylinder snugly. A hook on the rear of the truck provides a convenient place to hang mask assemblies. *Ohio Chemical & Surgical Equipment Co., Madison 10, Wis.*

The "Ozium" no. 500 air conditioner measures 4¾ by ⅞ inches. Each "personal size" container provides 500 individual sprays that are said to remove smoke quickly, destroy odors, reduce air-borne bacteria and beneficially treat the air indoors wherever people congregate. A press of the chrome button releases the spray. *Woodlets Inc., 2048 Niagara Street, Buffalo 7, N.Y.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

The association between deciduous dentin sclerosis and calcium hydroxide methyl cellulose base material. *Arthur I. Klein. 1958.* M.S.D. *Indiana University.*

Resistivity of silver-tin amalgams. *Richard Schnell. 1958.* M.S. *Indiana University.*

Estimation of the combined widths of certain unerupted mandibular teeth. *Richard Harold Oldfather. 1957.* M.S. *State University of Iowa.*

A study of retarded tooth development. *John Junior DeGooyer. 1957.* M.S. *State University of Iowa.*

A study of certain of the effects of rotating instruments when cutting dental tissues at speeds in excess of 150,000 rpm. *Fred W. Bruner. 1958.* M.S. *University of Michigan.*

A preliminary investigation of the feasibility of stainless steel files as root canal filing instruments and as a root canal filling material. *John F. Bucher. 1958.* M.S. *University of Michigan.*

A study on the relationship between the level of plasma cholinesterase and the duration of succinylcholine induced apnea. *Ralph Louis Lotshaw. 1957.* M.SC. *Ohio State University.*

The effect of dental ultrasonic energy upon the periodontal membrane of the dog. *Rollin Elliott Mallernee. 1957.* M.SC. *Ohio State University.*

The incidence of pulp stones as evidenced radiographically in primary and young permanent teeth. *Elliott McKaughan Hester. 1958.* M.S. *University of North Carolina.*

A functional cephalometric radiographic investigation of the nasal and oral pharyngeal structures during deglutition in non-cleft palate individuals. *Pirkko H. Nohrstrom. 1958.* M.S.D. *Northwestern University.*

A serial cephalometric radiographic investigation of anterior maxillary area and incisal changes of Class II, Division I malocclusion (Angle) during orthodontic treatment. *Albert Reinstein. 1958.* M.S.D. *Northwestern University.*

A cephalometric radiographic evaluation of the relationship of the maxillary and mandibular incisors to each other and to the cranium, before and after treatment. *Richard Swoiskin. 1958.* M.S.D. *Northwestern University.*

A study of the histological changes in bone following insertion of extra-oral skeletal fixation pins. *Frank G. Pavlakovich. 1958.* M.S. *University of Pittsburgh.*

Changes in the dental pulp after anaphylactic shock (Modificazione della polpa dentale per choc anafilattico). *Nicola Festa. 1957.* SPEC. ODONT. *School for Dental Specialties, University of Bari, Italy.*

Diathermy in root canal treatment (La diatermia nella cura canalare dentaria). *Francesco Lofosso. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Bari, Italy.*

Homeopathy in dentistry (Omeopatia in odontoiatria). *Ettore Zucchetti. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

Oral sepsis and the ocular apparatus (Sepsi focale stomatogena ed apparato oculare). *Franco Cappelletti. 1957* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

Riga-Fede disease (La malattia di Riga-Fede). *Giuseppe Savi. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

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The index to volume 3 of DENTAL ABSTRACTS, covering the twelve issues published in 1958, will be printed in the December 1958 issue. The index will include a list of the periodicals from which articles are abstracted, with addresses.